

AUTHOR INDEX

A

Abdel-Monem, M., 429
 Abdullaev, Kh. A., 219, 220, 232
 Abdurakhmanova, Z. N., 218, 223
 Abelson, P. H., 76
 Abramsky, T., 106
 Acevedo, E., 278, 301, 304, 309
 Ackerman, T. L., 299, 301
 Adamova, N. P., 61
 Adams, B., 173, 182
 Adams, D. G., 337
 Adams, F., 523, 541
 Adams, H. R., 439, 448, 452
 Adams, M. W., 542, 545
 Adesnik, M., 35
 Adler, I., 240, 241
 Adler, J., 467, 482
 Adolph, K. W., 322
 Afting, E.-G., 208
 Agarwala, S. C., 528, 544
 Aghion, P., 249
 Agro, A. F., 37
 Ahmad, N., 132, 133
 Aizer, R. S., 531
 Akazawa, T., 69
 Akhmedov, Yu. D., 232
 Akhmedova, L. R., 232
 Akhtar, M., 99, 166, 174
 Akintobi, T., 463, 469
 Akoyunoglu, G., 98
 Aksenova, N. P., 249
 Albersheim, P., 79
 Alberte, R. S., 326, 327
 Albertini, D. F., 496
 Alberts, B., 428-30
 Alberts, B. M., 474
 Albertsson, P.-Å., 36
 Albrecht, S. L., 265, 266
 Albright, L. J., 27, 30, 34
 Aleem, M. I. H., 74
 Alessi, J., 282, 286, 304, 306
 Alexander, G. V., 539
 Alexander, K., 174
 Alexandrov, V. Ya., 25, 31, 33
 Ali, S. M. E., 521
 Aliev, K. A., 217, 220, 224
 Allaway, W. G., 381, 384, 386, 387, 390, 391, 401, 402, 405
 Allaway, W. H., 535, 536
 Allen, L. H. Jr., 293, 294
 Allen, M. M., 326
 Allen, R. D., 490
 Allen, R. L., 115
 Allen, R. N., 482
 Allsopp, A., 245, 250
 Al-Saadi, H. A., 385
 Altenburg, L. C., 31, 36

Altman, K. I., 102
 Alves, L. M., 162
 Amalric, F., 27-29
 Amann, H., 348
 Ambler, J. E., 512, 513, 532, 538, 541, 542, 544, 545
 Amin, J. V., 524
 Amrhein, N., 479
 Anders, J., 498, 499
 ANDERSEN, K., 263-76; 264-69
 Andersen, K. S., 230
 Anderson, A. J., 536, 542
 Anderson, C. D., 296
 Anderson, E., 496
 Anderson, J. D., 155
 Anderson, J. M., 225, 226
 Anderson, L., 69-71
 Anderson, O. E., 529, 545
 Anderson, W. P., 439, 444, 445, 452
 Andresen, H. A., 26
 Andrew, C. S., 518, 519, 522, 523, 525, 526
 Andrews, D. M., 138
 Andrews, T. J., 232, 391
 Angelocci, L. R., 299
 Angus, J. F., 298
 Antonovics, J., 536, 545, 546
 Apel, K., 220, 225
 Apirion, D., 30, 37
 Appel, W., 348
 Appleby, C. A., 272
 Apte, S. K., 328
 Arca, M., 32
 Aresenault, G. P., 463, 473
 Arigoni, D., 166, 174
 Arisz, W. H., 451
 Armiger, W. H., 523, 525, 527
 Armstrong, J. B., 37
 Armstrong, J. J., 224
 Arndt, S., 30, 33, 36, 37
 Arnold, L. M., 34
 Arnold, W., 47, 48, 58-61
 Arnon, D. I., 69-72, 447
 Arnon, I., 278-80, 283, 284, 286, 297
 Arnstein, H. R. V., 34
 Arpin, M., 31
 Arron, G. P., 115
 Arsenaault, G. P., 164, 166
 Arthur, W. E., 48
 Artus, C. S., 38
 Arunachalam, T., 473
 Asahi, T., 207
 Asakawa, Y., 171
 Ashida, J., 545, 547
 Ashton, F. M., 194
 Ashton, W. M., 536

Ashwood-Smith, M. J., 26
 Aspinall, D., 302
 Astaurova, O. B., 29
 Atkinson, D. E., 451
 Atkinson, M. R., 451
 Atlas, H., 29
 Attoe, O. J., 525
 Aurich, O., 171, 176, 181, 225
 Austin, B., 391
 Austin, D. G., 476
 Austin, D. J., 476
 Austin, S. M., 321, 325, 329, 330, 332
 Ausubel, F., 263, 265, 266, 332
 Ausubel, F. M., 263
 Avadhani, P. N., 391
 Avivi-Bleiser, N., 115
 Avron, M., 60, 61, 127, 132, 133
 Awad, A. S., 517
 Axelrod, D., 38
 Azzi, J., 48, 58, 59, 61
 Azzi, J. R., 48, 49, 59, 60

B

Baarda, J. R., 449
 Babcock, G. T., 56, 57
 Bache, C. A., 537
 Bachofen, R., 70
 Badger, M. R., 391
 Baertschi, P., 81
 Bagdasarian, M., 103
 Bahr, J. A., 381, 402
 Baier, W., 280, 282
 Bajaj, A. S., 38
 Baker, D. A., 447
 Baker, D. E., 537, 539
 Baker, D. N., 227
 Bakker, H. J., 179
 Bal, A. K., 474
 Balke, N. E., 445, 449, 453
 Ball, E., 205, 244, 396, 397, 399, 401, 448, 451, 452
 Ballade, P., 257
 Ballarin Denti, A., 448
 Bamberg, S. A., 299, 301
 Banfalvi, Z., 274
 Baranowska, H., 524
 Barber, J., 51, 61, 347, 450
 Barber, J. T., 248
 Barber, L., 272, 273
 Barber, S. A., 514, 538, 542
 Barbier, G., 542
 Barbieri, G., 54, 57
 Barbour, M. G., 285, 300
 Barendse, G. W. M., 150
 Barker, R. E., 292, 293
 Barksdale, A. W., 463, 473, 474

- Barley, K. P., 287, 289, 301
 Barlow, E. W. R., 301, 302
 Barlow, S. A., 155, 160
 Barnes, D. K., 300
 Barnes, E. M. Jr., 445
 Barnett, W. E., 221
 Barry, P. H., 124, 136
 Bartholomew, B., 384
 Bartholomew, D. P., 385, 386
 Bartlett, R. J., 520, 534
 Barton, D. H. R., 174
 Baserga, R., 28
 Basilio, C., 28
 Bassett, B., 433
 Bassham, J. A., 70, 74, 76, 77
 Bateson, J. H., 179
 Battle, A. M. del C., 101, 114
 Battaglia, R., 166, 174
 Bauer, H., 206
 Bauer, P., 386
 Baumgartner, B., 208
 Baumhardt, G. R., 540, 543
 Baur, E., 217
 Baur, P. S., 197
 Bavrina, T. V., 249
 Bayliss, W. M., 462
 Bazil, G. W., 26
 Bazzaz, F. A., 538, 543, 544
 Bazzaz, M. B., 230
 BEALE, S. I., 95-120; 96, 101, 104-13, 115
 Beardall, J., 77
 Bearden, A. J., 57
 Bearder, J. R., 150, 154, 157, 162-66, 174-77, 179
 Beaton, J. D., 527
 Beavington, F., 536
 Beckers, F., 128, 135, 137-41
 Bedbrook, J. R., 220
 Beeley, L. J., 167, 181
 Beevers, H., 396
 Beffagna, N., 449
 Begg, J. E., 278, 287, 289, 291-95, 297, 298, 302, 303, 385, 397
 Beisenherz, W. W., 101, 115
 Belkin, S., 106, 107
 Benac, R., 525
 Ben-Amotz, A., 126, 127, 132
 Ben-Bassat, H., 37
 Bender, M. M., 78, 79, 82, 384, 404-6
 BENEDICT, C. R., 67-93; 70-73, 78-80, 82, 83, 85, 87, 390, 404
 Benedict, F., 518, 522
 Benemann, J. R., 331, 333
 Bennett, O. L., 301, 541
 Bennett, R. D., 162
 Bennett-Clark, T. A., 387
 Bennoun, P., 50, 55, 373, 374
 Benson, A. A., 77
 Bentrup, F. W., 443, 444, 448, 494, 504
 Benzioni, A., 287, 301
 Berezin, I. V., 141
 Berezovskii, K. K., 514, 519, 521
 Berg, A. R., 243, 247
 Berg, H. C., 467
 Berg, W. A., 525
 Berger, L. R., 34
 Bergersen, F. J., 263, 269-73
 Beringer, J. E., 274
 Berlin, R. D., 496
 Bernatskaya, M. L., 519
 Berndt, R. D., 280, 282
 Bernhard, W., 27
 BERNSTAM, V. A., 25-46; 27, 30, 33, 34, 36, 37
 Berrow, M. L., 537
 Berry, J., 231
 Berry, J. A., 70, 73, 79, 83, 85, 293, 309, 381, 383, 386, 391, 403, 406
 Berry, S. A., 31
 Berry, W. L., 544
 Bertrand, A. R., 532, 533, 537
 Bertsch, L. L., 429
 Bertsch, W. F., 48, 49, 58
 Best, W. Jr., 136
 Beteta, P., 206
 Bethé, A., 462
 Betz, H., 206, 208
 Beulich, K., 544
 Beuscher, N., 69, 73
 Bewley, J. D., 126, 174
 Bhan, K. C., 532
 Bhatt, K. C., 524
 Bhattacharya, N. C., 335
 BIALE, J. B., 1-23
 Bianchi, M., 476
 Bidinger, F. R., 298, 303
 Bidwell, R. G. S., 194
 Bielecki, R. L., 194, 519
 Bierhorst, D. W., 253
 Bierhuizen, J. F., 291, 296
 Biersdorf, G. T., 536, 544
 Biffi, G., 476
 Bigley, D., 69
 Bikasiyan, G. R., 232
 Bilsky, A. Z., 37
 Bingham, G. E., 293, 294
 Bingham, J., 304
 Bingham, S., 221
 Birch, A. J., 157
 Biscoe, P. V., 303
 Bishop, D. F., 101
 Bishop, D. G., 79, 220, 230, 232
 Bishop, F. C., 225
 Bishop, H., 475
 Bishop, N. I., 223, 333
 Bisht, S. S., 528, 544
 Bisson, M. A., 122, 124, 128, 131, 134, 137, 140
 Bistis, G., 480
 Bittell, J. E., 543, 544
 Bjerring, J. H., 544
 Björkman, O., 231, 287, 292, 381, 390, 391
 Black, C. C., 231, 380, 382, 387, 390-92, 397, 398, 402, 405
 Black, C. C. Jr., 69, 78, 79, 82
 Blair, G. E., 217, 226
 Blamire, J., 225
 Blankenship, R. E., 56, 57
 Blatt, C. R., 515
 Bledsoe, C., 452
 Bley, L., 390, 391
 Blinks, L. R., 367
 Bliss, L. C., 387
 Blixt, S., 222
 Blobel, G., 224
 Bloch, R., 488, 489, 497
 Blood, J. W., 557
 Bloom, R. J., 109
 Blum, A., 280, 285, 286, 292
 Blumberg, P. M., 36
 Boar, R. B., 174
 Boardman, N. K., 232
 Boawn, L. C., 542
 Bocks, S. M., 76
 Boer, P., 206
 Boersma, L., 301, 302
 Bogorad, L., 96, 103, 109, 217, 220, 224
 Boke, N. H., 240, 251
 Bollard, E. G., 512
 Boller, Th. P., 195-204
 Bonanou-Tzedaki, S. A., 34
 Bonaventura, C., 346
 Bondietti, E. A., 536
 Bongers, L., 268
 Bonhoeffer, F., 26
 Bonner, J. J., 29
 Bonnett, H. T. Jr., 254, 256
 Bonotto, S., 498
 Bont, W. S., 35, 36
 Boothroyd, E. R., 421, 433
 Boram, W. R., 427
 Borden, F. Y., 518
 Borgmann, E., 173, 182
 Borisov, A. Yu., 51
 Börner, Th., 223
 Borowitzka, L. J., 132, 133
 Bortins, J., 329
 Bortner, C., 529
 Borysenko, J. Z., 496
 Bossert, W. H., 462
 Bothe, H., 328, 333
 Bottomley, P. J., 327
 Bouges, B., 54, 57
 Bouges-Bocquet, B., 54
 Bouma, J. M. W., 210

- Bourget, S. H., 525
 Bourne, H. R., 479
 Boutry, M., 449
 Bowen, D. H., 154, 160, 166, 171
 Bowen, H. J. M., 536
 Bowen, J. E., 529
 Bowers, B., 206, 208, 500
 Bowes, G., 78, 85, 86, 232
 Bowman, B. J., 196, 442, 449
 Boyer, J. S., 122, 278, 296, 302, 303, 386, 387
 Boynton, J. E., 115, 223, 231
 Brachet, J., 487, 498
 Brack, C., 431
 Bracker, C. E., 449
 Bradbeer, J. W., 224, 380, 389, 390, 394
 Bradley, S., 325, 326, 335
 Bradshaw, A. D., 536, 545-47
 Bradstreet, E. D., 122
 Brams, E. A., 542
 Brand, M. D., 440
 Brandon, P. C., 391, 392, 400
 Branton, D., 133, 195, 197, 199, 204
 Braude, G. L., 535
 Brawley, S. H., 489, 492, 496
 Bray, J. R., 301, 305
 Bray, R. C., 98
 Breen, W. A., 233
 Breidenbach, R. W., 168
 Breitbart, H., 29
 Bremner, I., 530, 537
 Brett, M., 547
 Brewer, E. N., 26, 30, 34
 Bridges, B. A., 26
 Briggs, D. E., 159, 162, 183
 Briggs, G. E., 454
 Brill, W. J., 263, 265, 266, 325, 327, 332
 Brinkley, B. R., 38
 Briske, D. D., 290, 301
 Britton, G., 183
 Brock, T. D., 32
 Brocklehurst, J. R., 37, 38
 Brocklehurst, R., 446
 Brooks, R. R., 541, 546
 Brower, D. L., 536
 Brown, A. D., 132, 133
 Brown, C. M., 266, 271
 Brown, D. A., 467
 Brown, J. C., 512-14, 518, 521, 527, 529, 532-34, 538, 541, 542, 544, 545
 Brown, J. M. A., 86, 87
 Brown, L. F., 282, 306
 Brown, R., 247
 Brown, R. H., 231
 Browning, G., 183
 Browse, J., 86, 87
 Brulfert, J., 388
 Brun, W. A., 233
 Brunk, C. F., 26
 Brunnhöfer, H., 387
 Bryant, D. A., 366, 367
 Bryce, T. A., 323
 Brzeski, W., 102
 Brzozowska, J., 201, 203
 Buchanan, B. B., 69, 70, 72, 73
 Buchanan, J. M., 36
 Buchauer, M. J., 536
 Buchwald, H. E., 56
 Buckman, R. W., 71, 72
 Bucks, J. R., 466
 Buggy, J., 135
 Buggy, M. J., 183
 Bulen, W. A., 269
 Bu'Lock, J. D., 462, 476
 Bünning, E., 488, 489, 497
 Bunting, A. H., 298, 299
 Burg, S. P., 257
 Burgess, J., 246
 Burgett, H., 475
 Buringh, P., 278
 Burnett, E., 285, 286, 289
 Burnham, B. F., 113
 Burns, A., 269
 Burns, R. C., 266-69
 Burris, J. E., 79
 Burris, R. H., 265-69, 322, 325, 331, 380, 384, 395, 405, 406
 Burton, A. C., 126
 Buschbom, U., 278, 281, 282, 288, 291, 293, 294, 298, 300, 301, 306, 387
 Buser, Ch., 195, 197, 205, 208
 Butcher, H. C., 208
 Butel, J. S., 38
 Butler, G. W., 512
 BUTLER, W. L., 345-78; 56, 349, 351-53, 355-70, 372, 374-76
 Butterfass, T., 225
 Bye, J. M., 38
 Byers, B. R., 521
 Byfield, J. E., 26, 27, 29, 30
- C
- Cabib, E., 206, 208, 500
 Cadavid, L. F., 514, 516, 522
 Caldwell, M. M., 278, 282, 284, 285, 287, 288, 293, 296, 297, 299, 300, 306, 385
 Callan, H. G., 433
 Calley, A. G., 72
 Callow, M. E., 502
 Calvin, M., 57, 58, 69, 77
 Cambraia, J., 453
 Cammack, R., 327
 Camp, L. B., 282, 284, 285, 293, 297, 306, 385
 Campbell, G. S., 280, 284-86, 288, 299, 300
 Campbell, L. G., 523
 Campbell, R., 536
 Campbell, T. A., 523
 Campbell, W. H., 390, 392
 Cannell, R. Q., 233
 Cannon, F. C., 263
 Cannon, H. L., 536, 545
 Cansfield, P. E., 544
 Caplan, S. R., 440
 Cardemil, L., 323
 Carithers, R. P., 48, 50-52
 Carlile, M. J., 462, 466, 467
 Carlson, G. E., 300
 Carlson, R. W., 538, 543, 544
 Carpenter, A. T. C., 435
 Carr, G., 446
 Carr, J. L., 86
 Carr, N. G., 74, 75, 325, 326, 328, 330, 335, 337
 Carter, O. G., 527, 529
 Cartwright, B., 536
 Caso, O. H., 256
 Castelfranco, P. A., 96, 98, 105-8, 110-14
 Catt, K. J., 479
 Cavaliere, R., 37
 Cecich, R. A., 250
 Cedeno-Maldonado, A. J., 544
 Cha, J. W., 539
 Chabannes, J., 542
 Chabaud, R., 54
 Chafe, S. C., 197
 Chaffey, M. B., 162
 Chailakhyan, M. K., 249
 Chain, R. K., 447
 Chamberlain, M. J., 37
 Chan, A. P., 249
 Chan, I., 264
 Chan, P. H., 226
 Chandley, A. C., 416, 417, 422, 425, 429, 430
 CHANEY, R. L., 511-66; 512, 513, 537, 538, 541, 542, 544
 Changeux, J. P., 39
 Chapman, H. D., 541, 542, 544
 Chapman, J. M., 105
 Chase, G. R., 536
 Chatterton, N. J., 292
 Chayka, T. G., 30
 Chemeris, Yu. K., 61
 Chen, C. W., 496
 Chen, D., 35
 Chen, K., 220, 226
 Chen, L. B., 36
 Chenery, E. M., 516
 Chesnin, L., 537
 Cheung, W. Y., 75
 Cheung, Y. N. S., 122, 123, 130
 Chezeau, R., 201

Chiang, K. S., 217, 219
 Chien, W.-S., 321, 325, 329, 330, 332
 Child, J. J., 269
 Chilton, M. D., 416
 Chin, T. F., 533
 Chinoy, J. J., 524
 Chipman, E. W., 513, 526
 Chouard, P., 249
 Christeller, J. T., 79, 82, 404
 Christophersen, J., 25
 Chuah, H. H., 536, 546
 Chu-Der, O. M. Y., 219
 Chunaev, A. S., 219
 Church, K., 433
 Claassen, N., 538
 Clark, J. I., 496
 Clark, M. C., 524
 Clark, R. B., 514, 518, 519, 521, 522
 Clarke, M., 497, 504
 Clarkson, D. T., 514, 519
 Clay, H. J., 523
 Clayton, R. K., 48, 49, 60, 61, 349
 Cleland, R., 135, 488
 Cleland, R. E., 126
 Clement, C. R., 540, 543
 Clements, H. F., 513, 531, 533
 Cochran, D. E., 497
 Cockburn, B. J., 183
 Cockburn, M., 446, 452
 Cockburn, W., 390, 399
 Cocucci, M., 448
 Cocucci, S., 35, 449
 Codd, G. A., 328, 329, 335
 Coffino, P., 479
 Cohen, D., 289, 307
 Cohen, W., 48
 Cohen-Bazire, G., 74, 321, 322
 Cole, C. V., 452
 Coleman, P. S., 37
 Collins, F. W., 544
 Collins, J. F., 69
 Colombo, R., 448
 Conde, L. F., 385, 387
 Condeelis, J. S., 504
 Connor, D. J., 278, 282, 288, 292, 299-301, 304, 305, 308
 Constable, G. A., 303
 Contopoulos, R., 71
 Cook, A. H., 468, 475
 Cook, I. F., 179
 Cooke, R. J., 183
 Coolbaugh, R. C., 155, 159, 160, 180, 183
 Coombe, B. G., 204
 Cooper, J. P., 230
 Cooper, T. A., 231
 Cordero, R. E., 251
 Corneliusen, P. E., 535
 Correns, C., 217

Corson, G. E. Jr., 246, 248
 Cortat, M., 206
 Coster, H. G. L., 137-40
 Costerton, J. W. F., 136
 Couch, J. N., 482
 Coulomb, Ph., 194
 Coupland, R. T., 256
 Courtice, A. C., 450
 Courtin, G. M., 546
 Cowan, I. R., 287, 290-92, 294
 Cowling, D. W., 540, 543
 Cox, R. A., 31
 Cox, R. M., 327, 547
 Craddock, G. R., 537
 Craig, G., 473
 Craig, H., 78, 79, 81
 Craig, N., 33, 34
 Craigie, J. S., 132
 Cram, W. J., 125, 450-52
 Crandall, M., 462, 480
 Crayton, M. A., 492, 501-3, 505
 Cresti, M., 504
 Crews, C. E., 391, 398
 Croes, A. F., 466
 Crofts, A. R., 48, 61
 Cross, B. E., 164-66, 179
 Crozier, A., 171, 181
 Cullen, E. M., 301
 Cummings, R. W., 536
 Cummins, J. E., 26
 Cummins, J. T., 450
 Cunningham, B. A., 544
 Cunningham, J. D., 537, 544
 Cunningham, L. M., 544
 Curdts, E., 386, 398
 Curran, P. F., 126, 439
 Currier, T. C., 322, 334-36
 Curtis, D. L., 299
 Cushley, R. J., 98
 Cusick, F., 249, 256
 Cutler, J. M., 544
 Cutter, E. G., 240, 249-52
 Czuba, M., 542

D

Daesch, G., 268
 Dahl, A. L., 489
 Dainko, J. L., 195, 197
 Dainty, J., 122-24, 129-31, 136
 Dalton, H., 268, 269
 Daly, O., 196
 Damadian, R., 196
 Dampney, H. B., 302
 Dana, M. N., 515, 516
 Dana, M. S., 515
 Dancewicz, A., 103
 Daniel, R. M., 272, 273
 Daniels, R. R., 542, 544
 Darden, W. H., 478

Das, H. K., 34
 d'Auzac, J., 197-99, 201-3
 Davenport, D., 482
 David, D. J., 537
 David, H., 35
 David, K. A. V., 331
 Davidson, E. H., 487
 Davidson, J. B., 47, 48
 Davies, D. D., 399
 Davies, D. R., 219
 Davies, L., 174, 181
 Davies, L. J., 174
 Davies, P. J., 248
 Davies, R., 26
 Davis, G. K., 537
 Davis, R. H., 196, 205
 Davis, W. B., 521
 Dawson, R. M., 157
 Day, P. R., 233
 Dayton, D. F., 114
 De Albertis, J., 252
 Dean, P. M., 505
 De Boer, B. L., 442
 Decker, A. M., 541
 Decker, M., 447, 453
 Dedov, V. M., 517, 518
 Deery, W., 38
 De Fekete, M. A. R., 393, 394
 DeGarmo, H. C., 296, 301
 Degens, E. T., 77, 80-82, 85
 DeGroot, D., 87
 de Jong, E., 280, 285
 DeKock, P. C., 539, 544
 Delas, J., 537
 Deleens, E., 82, 386, 404, 406
 Delgado, M., 387
 Delhez, J., 449
 Della Rosa, R. J., 102
 Delosme, R., 53, 54, 56
 Delrieu, M. J., 55, 57
 Demel, R. A., 141
 De Michaelis, M. I., 448
 Dempsey, E., 424
 Den Haan, G. A., 50, 51, 53, 54, 56, 57
 Denius, H. R., 395
 Denmead, O. T., 284
 Dennis, D., 526
 Dennis, D. T., 155, 158, 159, 180, 183
 Dennis, F. G., 177
 Deputis, E. J., 288, 299, 300
 de Robichon-Szulmajster, H., 198, 200
 De Rosier, D., 504
 Desai, T. S., 58-60
 de Sousa, A. S., 536
 Despaigne, D. G., 387
 Dessureaux, L., 516, 523, 526, 531
 Deuser, W. G., 80-82, 85
 de Vasconcelos, L., 335

- Devine, T. E., 523
 De Vos, O. C., 250
 DeVries, A., 30
 de Vries, M. P. C., 538
 Dewey, W. C., 26, 37
 de Wit, C. T., 282, 295, 296,
 304, 305, 308, 309
 Dhar, A. K., 160
 Dharmawardene, M. W. N.,
 321, 329, 332, 333
 Dhindsa, R. S., 126
 Dickinson, H. G., 415
 Dickson, J. A., 37
 Dieckert, J. W., 530
 Diers, L., 197
 Dijkstra, M. L., 493
 Dilworth, M. J., 266, 269, 271
 Din, G. A., 69
 Dionne, J. L., 525
 Di Palma, J. R., 136
 Diskin, S., 282, 288, 299
 Dittrich, P., 382, 390, 392, 401
 Dixon, R., 263
 Dixon, R. O. D., 272, 273
 Dobereiner, J., 527, 530
 Dodd, G. H., 482
 Dodge, C. D., 514
 Doelle, H. W., 67
 Döhler, G., 77
 Doi, E., 207, 208
 Doi, Y., 525
 Doley, D., 278, 288, 292, 308
 Dollevoet, P. L., 38
 Donald, C. M., 283, 304
 London, J., 32
 Donike, M., 463, 469
 Dontsova, S. V., 224
 Donze, M., 56, 326, 327, 331
 Doohan, M. E., 78, 79
 Dooley, H. L., 537
 Doolittle, W. F., 75
 Dore, J., 256
 Döring, G., 56
 Dorn, C. R., 536
 Doss, B. D., 301, 512
 Doudoroff, M., 71, 332, 333
 Doughty, M. J., 482
 Douglas, W. W., 497
 Douka, C. E., 513
 Dover, G. A., 433
 Dow, B. K., 525
 Dowler, W. M., 521
 Downes, R. W., 291, 293, 296
 Downton, W. J. S., 79, 230,
 231
 Dragun, J., 539
 Drake, D., 476
 Drisel, P. A., 479
 Drissler, F., 58
 Dromgoole, F. I., 86, 87
 Dropkin, V. H., 444, 447
 Drozdova, I. S., 223
 Drummond, M. H., 416
 Dudman, W. F., 269
 Dufau, M. L., 479
 Dufour, J. P., 449
 Dufresne, W. J., 38
 Duggan, J., 113
 Dugger, W. M., 391
 Dunn, E. L., 278, 282, 288,
 290, 292, 300
 Dunn, J. H., 323, 325
 Dunstone, R. L., 228
 Duntze, W., 463, 480
 Dupont, J., 198, 199
 Duprat, A. M., 27
 Duran, A., 500
 Duranton, J., 98
 Durley, R. C., 164, 166, 169,
 171, 173, 174, 181
 Dürr, M., 195-200, 202
 Durwald, H., 429
 Durzan, D. J., 197
 Dusek, D. A., 282, 302
 Dutton, P. L., 52
 Duysens, L. N. M., 49, 51-54,
 56, 57, 348, 352
 Dwyer, D. D., 296, 301
 Dykeman, W. R., 536
- E
- Earley, E. B., 545
 Earnshaw, P., 446, 452
 Eaton, G. W., 526
 Eckardt, F. E., 307-9
 Eckerman, G., 451
 Eckert, R., 482
 Ecklund, P. R., 155, 180
 Eddy, A. A., 195, 201, 446,
 452
 Edelman, G. M., 26, 37, 38,
 495, 496, 504
 Edwards, D. G., 517
 Edwards, G. E., 230
 Edwards, J. A., 473
 Edwards, M., 125
 Eenink, A. H., 531
 Eeuwens, C. J., 169
 Egan, J., 221
 Egberts, D. J. N., 56
 Egel, R., 480
 Eggert, D. A., 523
 Egle, K., 387
 Ehleringer, J., 287, 292, 293,
 309
 Eickmeier, W. G., 406
 Eisbrenner, G., 333
 Eisenberg, S., 429
 Ejchart, A., 524
 Ekong, D. E. U., 162, 177
 Elgawhary, S. M., 516, 538
 El Kheir, Y., 195, 197
 Ellenson, J. L., 61
 Elliott, A. G. L., 522
 Elliott, J., 269
 Elliott, W. H., 101
 Ellis, B. G., 535, 538
 Ellis, E. A., 474
 Ellis, R., 111
 Ellis, R. J., 217, 224, 226
 Ellison, J. J., 38
 Elsdon, S. R., 71
 Elson, E. L., 38
 Elvidge, J. A., 468, 475
 Elzam, O. E., 449
 Emerson, R., 346, 359, 360,
 465, 468, 471
 Emmelot, P., 35, 36
 Emsweller, S. L., 421
 Engelhardt, D. L., 38
 Engelke, A. L., 251
 Engler, R. M., 525
 English, S. D., 294, 295
 Enns, L. H., 439, 448
 Enticott, S., 332
 Epel, B., 433
 Epstein, E., 447, 449, 512, 514
 Epstein, H. T., 217
 Epstein, S., 78-82, 85
 Epstein, W., 446
 Erhardt, W. H., 541
 Erickson, R. O., 135, 242, 246,
 251
 Ernst, W. H. O., 546, 547
 Erwin, J. A., 37
 Esau, K., 243
 Eshel, A., 518
 Esposito, M. S., 417
 Esposito, R. E., 417
 Essig, A., 440
 Etherington, J. R., 534
 Etherton, B., 447
 Etienne, A.-L., 50, 55
 Evans, A., 183
 Evans, A. F., 228
 Evans, E. H., 61
 Evans, H. J., 267, 269, 272,
 273, 497
 Evans, L. S., 243, 247
 Evans, L. T., 227, 228, 304,
 382
 Evans, L. V., 502
 Evans, M. C. W., 69, 70, 72,
 327, 328, 331
 Evans, P. S., 524
 Evans, R., 155, 157, 161, 164,
 165, 175, 179
 Evans, R. J., 505
 Evans, W. R., 269
 Evenari, M., 278, 281, 282,
 284, 288, 291, 293, 294, 298,
 300, 301, 306, 387
 Everson, R. G., 79
 Eytan, G., 224

F

- Faierman, I., 35
 Fairbairn, J. W., 195, 197
 Falchuk, K. H., 544
 Falkenberg, B., 328
 Fall, R. R., 158
 Fanelli, A. R., 37
 Farnden, K. J. F., 271, 273, 274
 Farquhar, G. D., 290, 294
 Farrelly, J. G., 221
 Faust, M., 515, 517
 Fawcett, D. W., 544
 Fay, P., 321, 323-27, 331, 334, 335
 Feldherr, C. M., 29
 Feldman, L. J., 250
 Felle, H., 444, 448
 Fensom, D. S., 136
 Fenzl, F., 453
 Fereres, E., 278, 304, 309
 Ferguson, A. R., 208
 Ferree, D. C., 523
 Ferrier, J. M., 124, 129
 Ferrioli, A., 448
 Ferstenberg, L. B., 547
 Fettiplace, R., 138
 Fick, G. W., 301, 308
 Filippovich, I. I., 217
 Filmer, D. L., 231
 Filner, P., 479
 Findlay, G. P., 136, 450
 Finkelstein, A., 442
 Finn, A. L., 439
 Finn, I. J., 525
 Fiorino, J. A., 535
 Fischer, K., 384
 FISCHER, R. A., 277-317; 286, 289, 302-4
 Fisher, A. G., 526
 Fisher, D. J., 541
 Fisher, J. B., 240, 251, 257
 Fisher, J. D., 449
 Fisher, R. D., 228
 Fishman, T. N., 245
 Fiskell, J. G. A., 542
 Fitzpatrick, E. A., 279, 280, 285
 Flagg, J. L., 445
 Flechthen, V. R., 225
 Fleischman, D. E., 48, 50, 60, 61
 Fleming, A. L., 514, 515, 517, 519, 522, 523, 525-27
 Fleming, H., 322, 326, 328, 329, 331, 334-36
 Florian, R. L., 282, 285
 Flowers, T. J., 133
 Fluhr, R., 112
 Foard, D. E., 245
 Fogel, S., 417
 Fogg, G. E., 324, 325, 331, 333, 335
 Folsom, T. C., 546
 Forbush, B., 54
 Forer, A., 496, 504
 Fork, D. C., 223
 Forman, M., 491-93, 501, 504
 Forrai, T., 274
 Fosket, E. B., 250
 Foster, A. S., 248, 253
 Foster, K. W., 289, 299, 309
 Foster, P. L., 547
 Foulds, I. J., 326
 Foury, F., 449
 Fowke, L. C., 246
 Fowler, C. F., 61
 FOY, C. D., 511-66; 512-18, 522, 523, 525-27
 Francis, C. W., 539, 544
 Franck, D. H., 250
 Frank, A. B., 292, 293
 Franke, W. W., 504
 Fraser, D. C., 536
 Freed, J. J., 246
 Freienstein, C., 35
 Freire, J. R., 531
 Frey, N. M., 293
 Friedman, H., 34, 35
 Friedman, S. M., 31
 Friedman, H. C., 109
 Friedrich, U., 479
 Frink, G. R., 529
 Frith, G. J. T., 515
 Frontali, L., 32
 Frost, R. G., 158
 Frydman, V. M., 166, 168-70, 175, 177, 181
 Frye, J., 38
 Fuehring, H. D., 284
 Fujimori, E., 57, 58
 Fukada, E., 142
 Fukami, M., 535, 547
 Fulkerson, W., 537
 Fuller, G. M., 38
 Fuller, R. C., 69-72
 Furman, S. C., 26
 Furr, A. K., 537
 Furuta, S., 59
 Fuwa, K., 535, 547
 G
 Gabelman, W. H., 518
 Gaitskhoki, B. S., 225
 Gale, J., 382, 387, 393
 Gallagher, J. N., 303
 Galmiche, J.-M., 98
 Galonsky, A., 329, 332
 Galpin, M., 194
 Galston, A. W., 447
 Galt, R. H. B., 166
 Galun, E., 491
 Garber, M. J., 301
 Garcia-Miragaya, J., 538, 544
 Gardner, D., 446
 Gardner, H. R., 282, 285
 Garnier-Dardart, J., 391, 399, 401, 404
 Garretsen, G., 531
 Gartside, D. W., 546
 Gascón, S., 206
 Gaskin, P., 154, 155, 159, 160, 164, 166-71, 174, 175, 177, 181
 Gassman, M., 113
 Gassman, M. L., 101, 103, 109
 Gates, D. M., 290-92
 Gauch, H. G., 513, 532, 541, 544, 545
 Gauhl, E., 231
 Gause, E. M., 35
 Gayler, K. R., 204
 Geck, P., 439
 Gee, R., 450
 Geels, J., 35, 36
 Geering, H. R., 538
 Gehring, U., 474, 479
 Gej, B., 228
 Gellert, M., 428
 Genevès, L., 28
 Genge, S. D., 225
 Gerhart, J., 38
 Gerloff, G. C., 512, 515, 517, 518
 Gerrits, J. P., 268
 Gerrits, N. M., 61
 Gerweck, L. E., 26
 Gest, H., 71, 267
 Geurts van Kessel, W. S. M., 141
 Giaquinta, R., 447, 451
 Gibbons, G. G., 225
 Gibbs, M., 69, 75, 77, 215, 231, 381, 391, 394, 402
 Gibor, A., 217
 Gibson, A. H., 269
 Gibson, E. J., 532, 533, 537
 Gibson, J., 72-74
 Gibson, J. L., 75
 Gibson, K. D., 98, 100, 103
 Gifford, E. M., 253
 Gifford, E. M. Jr., 246, 248
 Gifford, R. M., 290, 293
 Gigon, A., 515
 Gilbert, B. E., 31
 Giller, Yu. E., 222, 223, 226
 Gilles, R., 125, 132, 133
 Gillespie, D., 27, 29, 30
 Gillette, E. L., 26, 37
 Gillham, N. W., 115
 Gilliam, J. W., 518
 Gillies, C. B., 420

Gingell, S. M., 536
 Ginter, W. D., 396
 Ginzburg, B. Z., 127, 128, 290
 Giordano, P. M., 512, 513, 537
 Giunta, C., 207
 Gläser, M., 56
 Glaszio, K. T., 204
 Glave, A., 302
 Glazer, A. N., 366, 367
 Glover, H., 77
 Glover, H. E., 77
 Godik, V. I., 51
 Goedheer, J. C., 48
 Goeller, H. E., 537
 Goffeau, A., 449
 Goldbeck, J. H., 327
 Goldberg, A. R., 37, 38
 Goldberg, R. B., 265, 266, 332
 Golden, M. L., 541
 Goldschmidt, E. E., 197, 199, 204
 Goldstein, A., 34
 Goldstein, E. S., 28, 30, 33, 34
 Goldstein, L. D., 231
 Gomez, R. F., 26
 Gómez-Campo, C., 244
 Gonik, S. A., 517
 Gooday, G. W., 464, 475
 Goodchild, D. J., 232
 Goode, J. E., 302-4
 Goodenough, U. W., 219, 224
 Goodwin, T. W., 183, 477
 Gorban, I. S., 36
 Gordon, J. K., 265, 266
 Gordon, M. P., 416
 Gostinskii, S. A., 223
 Gottschalk, G., 69, 73
 Gottschalk, W., 222, 223
 Gough, S., 115
 Gough, S. P., 106, 108, 109, 113, 114
 Goulding, K. H., 76
 Govindjee, R., 48, 60, 61, 215, 230
 Gowans, K. D., 526
 Grace, J., 300
 Gradmann, D., 142, 442, 444
 Graebe, J. E., 150, 154, 155, 159-61, 166-68
 Graham, A. M., 225
 Graham, D., 76, 79
 Graham, E. R., 538
 Graham, J. M., 37, 38
 Graham, J. R., 346
 Granick, S., 96, 98, 100, 106, 108-10, 113
 Grant, D. W., 27, 31
 Grant, M., 451
 Graven, E. H., 525
 Graves, J. S., 126, 128, 129, 131, 134

Gray, J. C., 220, 226
 Greacen, E. L., 282, 286, 287, 289, 301
 Green, D. M., 473
 Green, P. B., 123, 135, 246
 Green, T. R., 183
 Greenway, H., 132
 Gregory, F. G., 388
 Gregory, R. P. G., 545, 546
 Greidamus, T., 515
 Grew, N., 380, 407
 Grieninger, G. E., 498, 499
 Grieve, A. M., 225
 Griffin, D. H., 474
 Griffiths, W., 537
 Grigg, G. W., 26
 Grime, J. P., 520, 522
 Grimme, L. H., 101, 106, 112
 Grodzinsky, A. J., 142
 Grogan, C. O., 517, 521
 Gromov, B. V., 322
 Groner, B., 474
 Gros, D., 32
 Gros, F., 32
 Gross, M., 32
 Grossman, L. I., 428
 Grove, B. K., 31
 Grover, N. B., 127, 128
 Gruber, M., 210
 Gruenstein, E., 496
 Grunberg-Manago, M., 31, 32
 Guern, N., 28
 Guerrier, D., 388
 Guest, P. L., 541
 Guillard, R. R. L., 77
 Gulline, H. F., 247
 Gupta, B. D., 544
 Gupta, U., 513, 526
 Gurney, E., 263
 Gustafsson, A., 222
 Gutenmann, W. H., 537
 Gutierrez, M., 230
 Gutknecht, J., 122, 124, 126, 128, 129, 131, 134, 135, 137, 140
 Guyer, W., 206

H

Haagen-Smit, A. J., 473
 Haars, L., 37
 Haass, D., 447, 453
 Haber, A. H., 245
 Hadfield, K. L., 269
 Hadjipetrou, L. P., 268
 Hachnel, W., 61
 Hägele, W., 58
 Hageman, R. H., 78, 232
 Hagemann, R., 219, 223
 Haghir, F., 541
 Hahn, G. M., 37

Hahne, H. C. H., 538, 543, 544
 Haidri, S. Z. A., 395
 Haight, T. H., 252, 254
 Hakim, F., 195, 197
 Haldane, J. B. S., 481
 Hall, A. E., 228, 278, 289, 293, 295, 297, 299, 306, 308, 309
 Hall, D. O., 327
 Hall, H., 526
 Haller, W. T., 85, 86
 Hallier, U. W., 223
 Hallsworth, E. G., 544
 HALPERIN, W., 239-62; 249, 250
 Halstead, R. L., 536, 542
 Halvorsen, A. D., 539, 540
 Hamblin, J., 283, 304
 Hamilton, J. R., 267
 Hamilton, R., 160
 Hamilton, W. A., 446
 Hamkalo, B. A., 29
 Hammel, H. T., 122
 Hampel, A., 37
 Hampp, R., 102, 183, 544
 Hamzi, H. Q., 251
 Handley, R., 439, 448, 452
 Hanks, R. J., 282, 285
 Hanna, W. W., 292
 Hannon, N. J., 522
 Hanower, P., 201, 203
 Hanscom, Z., 386
 Hansen, D., 449
 Hanson, C. H., 300, 523
 Hanson, J. B., 444, 448, 451, 452
 Hanson, J. R., 150, 154, 155, 157, 161, 162, 164-66, 174, 175, 179
 Hansson, G., 450
 Hardon, M. J., 34
 Hardt, H., 61
 Hardy, R. W. F., 266-69, 273
 Harel, E., 105-7, 110, 112
 Harley, J. L., 396
 Harnischfeger, G., 357
 Harold, F. M., 438, 439, 445, 446, 448, 449
 Harper, J. L., 297, 298, 302
 Harries, D., 29
 Harris, A., 157
 Harris, G. A., 280, 284-86, 288, 299, 300
 Harris, H., 498
 Harris, J. W., 37
 Hart, R. H., 300
 Hartley, M. R., 217, 224, 226
 Hartney, V. J., 294, 384
 Hartsock, T. L., 384
 Haruta, H., 158
 Harvey, W. E., 166, 175
 Haschke, H.-P., 205
 Hase, E., 111, 115

- HASELKORN, R., 319-44;
 322, 325-29, 331, 332,
 334-36, 338
 Hasilik, A., 195, 206-8
 Hassett, J. J., 538, 540, 541,
 543
 Hasson, E. P., 159
 Hastings, D. F., 122, 124, 128,
 131, 137, 140
 Hatch, M. B., 543
 Hatch, M. D., 69, 78, 87, 230,
 231, 380, 381, 392, 394, 400,
 401
 Hatch, T. P., 113
 Hattersley, P. W., 391
 Hatton, I. K., 166
 Hattori, A., 329
 Haug, A., 37
 Haupt, W., 504
 Haury, J. F., 322, 334-36
 Hauska, G., 438
 Havelka, U. D., 267, 273
 Haveman, J., 50, 56, 57, 326,
 327
 Havill, D. C., 515
 Hawf, L. R., 544
 Hawker, J., 154, 161, 162, 165,
 175
 Haxo, F. T., 367
 Hayden, R. A., 523
 Haydon, D. A., 138
 Haye, S. N., 541
 Haystede, A., 321, 329, 331-33
 Heald, J. K., 173, 182
 Hearn, A. B., 294, 295, 303
 Heath, R. L., 544
 Hebant-Mauri, R., 247
 Heber, U., 34, 394, 402, 438
 Heber, U. W., 223
 Hecht, N. B., 430
 Hecker, L. I., 221
 HEDDEN, P., 149-92; 154,
 155, 158-61, 164-68, 175,
 179, 180
 Heenan, D. P., 527, 529
 Heftmann, E., 162, 175, 207
 Hegarty, M. P., 525, 526
 Heichel, G. H., 230
 Heil, A., 29
 Heilage, W. D., 536
 Heilbron, I., 468, 475
 Heilmeyer, L. Jr., 103, 110
 Heim, R., 529
 Heininger, B., 396
 Heinze, J. G., 529
 Heinz, E., 439
 Hellebust, J. A., 77, 125, 127,
 132, 133, 194
 Hellkvist, J., 122, 130
 Hemmerling, J., 487, 489, 498
 Hemmingsen, E. A., 122
 Hemperly, J. J., 38
 Hemphill, D. D., 536
 Henderson, D. W., 278, 304,
 309
 Henderson, R. C., 285, 286,
 289
 Hendler, R. W., 33, 35, 36
 Hendriks, T., 476
 Hendrix, D. L., 444, 445, 449,
 453
 Hendrix, J. W., 523
 Hendry, G. A. F., 103, 106,
 114
 Henkel, J., 232
 Henkel, P. A., 35
 Henning, S. J., 515, 516, 519
 Henningsen, K. W., 110, 112,
 223
 Hensel, H., 25
 Henzell, R. G., 289
 Hepler, P. K., 491, 492, 496,
 504
 Hermans, J. M. H., 466
 Herrick, G., 428
 Herrmann, F., 223, 225
 Herth, W., 504
 Herzberg, M., 29
 Hesketh, J. D., 227
 Heslop-Harrison, J., 415
 Hesse, P. R., 516
 Hester, J. B., 521
 Hew, C. S., 382, 383
 Hewitt, E. J., 512, 525, 536,
 541, 542
 Hiatt, A. J., 514
 Hickman, C. J., 482
 Hicks, G. S., 253
 Higginson, B., 31
 Highfield, D. P., 38
 Highkin, H. R., 232, 353
 Higinbotham, N., 439, 444,
 445, 447-49, 452
 Hignett, C. T., 282, 286
 Hill, A. E., 452
 Hill, B. S., 452
 Hill, D. J., 337
 Hill, G. G. C., 463, 471
 Hill, H. M., 155, 183
 Hill, R., 48
 Hill, R. D., 390, 405
 Hill, S., 267, 268
 Hiller, R. G., 132, 225
 Hind, G., 198, 199, 453
 Hinkle, D. C., 37
 Hinz, H., 208
 Hiraga, K., 171, 173, 181, 182
 Hirai, M., 207
 Hirano, S. S., 160
 Hirasawa, F., 516, 519, 522
 Hirata, H., 439, 441
 Hirst, W., 31
 Hitch, C. J. B., 338
 Ho, T. W. M., 242
 Ho, Y. K., 105
 Hoad, G. V., 181
 Hoare, D. S., 71-75
 Hoare, S. L., 74, 75
 Hochman, J., 479
 Hodges, T. K., 445, 447-50,
 452, 453
 Hodgson, J. F., 535-38
 Hodgson, J. G., 520, 522
 Hodgson, W. A., 523, 524
 Hoering, T. C., 76
 Hoffen, A., 518
 Hoffer, G. N., 521
 Hoffman, G. J., 301
 Hoffman, L. R., 463, 471
 Hoffmann-Berling, H., 429
 Hofner, W., 530
 Hogan, G. D., 546
 Hogness, D. S., 28, 29
 Hogsett, W. E., 493, 502, 503
 Holding, A. J., 531
 Holley, R. A., 206
 Holliday, R., 417, 418
 Holm, P. B., 433
 Holmes, C. W., 536
 Holmgren, P., 292, 293
 Holm-Hansen, O., 75, 79
 Holwill, M. E. J., 482
 Holzapfel, Ch., 139
 Holzer, H., 195, 206, 208, 209
 Homann, P. H., 347, 395
 Honeysett, J. L., 538
 Hooper, J. K., 113, 224, 225
 Hoorn, B., 36
 Hope, A. B., 136, 443, 444,
 450, 451, 454
 Hopper, M. J., 540, 543, 544
 Hopwood, D. A., 274
 Horgan, R., 173, 182
 Horgen, P. A., 473, 474
 Hornick, S. B., 544
 Horton, B. D., 517
 Horvath, D. J., 541
 Hosoda, J., 431
 Hotchkiss, C. W., 449
 HOTTA, Y., 415-36; 416-21,
 423-25, 428-31
 Hough, R. A., 79, 86
 Hovenkamp-Obbema, R., 111
 Howard, M. E., 528
 Howard-Williams, C., 546
 Howeler, R. H., 514, 516, 522,
 531, 533
 Howell, S. H., 419, 423
 Hoy, D. J., 37
 Hsiao, T. C., 34, 35, 126, 132,
 278, 293, 301, 304, 309
 Hsung, J.-C., 37
 Huang, C.-Y., 544
 Huang, L., 37
 Huber, W., 102, 382
 Huber-Guyer, U., 204

- Huber-Wälchli, V., 195, 196, 204
 Huffaker, R. C., 209
 Huisman, W., 210
 Huizinga, A., 35, 36
 Hulett, L. D., 536
 Humphreys, M. O., 546
 Hundeman, P. T., 541
 Hunter, B., 303
 Hunter, F. A., 326, 377
 Hunter, J. G., 536, 542
 Hurd, E. A., 286, 301
 Hüsken, D., 123-25, 129, 130
 Huskey, R. J., 479
 Hussey, G., 247
 Hutchinson, F. E., 518, 522
 Hutchinson, T. C., 536, 544
 Huvos, P., 31
 Hyder, D. N., 290, 301
 Hyndman, L. A., 268
 Hynes, N., 474
 Hynes, R. O., 38, 466
- I
- Iandolo, J. J., 30, 36
 Ichikawa, T., 58-60
 Ihlenfeldt, M. J. A., 74
 Iitaka, Y., 182
 Ikeda, H., 528
 Ikusima, I., 85
 Imai, I., 542
 Imaichi, R., 254
 Imanishi, M., 526
 Inbar, M., 37
 Indge, K. J., 195, 197, 201
 Ingram, V., 30, 32, 34
 Inkson, C., 446
 Inness, W. E., 34
 Inoue, Y., 58-60
 Inuyama, S., 282, 302
 Irving, E. A., 101
 Ishida, A., 513
 Isogai, Y., 169
 Itai, C., 287, 301
 Iten, W., 194
 Itoh, S., 48, 57, 58
 Iwamura, T., 217
 Iwata, T., 158
 Izawa, M., 217
- J
- Jachymczyk, W., 524
 Jackson, P., 304
 Jackson, P. C., 439, 448, 452
 Jackson, W. A., 69, 518
 Jackson, W. T., 496, 504
 Jacob, J. L., 197-99, 201
 Jacobs, H. S., 297
 Jacobs, W. P., 246
 Jacobsen, L., 490
 Jacobson, G. K., 417
 Jacobson, L., 439, 448, 452, 526
 Jacoby, B., 448-52
 Jaenicke, L., 462-65, 468-70, 478
 Jaffe, L. F., 489-91, 493-95, 504, 505
 Jaffre, T., 529, 546
 Jagels, R., 78
 Jagendorf, A. T., 61, 226
 Jans, B., 195, 197, 206
 Jarvis, M. S., 292, 293
 Jarvis, P. G., 122, 130, 287, 292, 293
 Jarvis, S. C., 540, 543, 544
 Jay, G., 35
 Jayman, T. C. Z., 520
 Jeanjean, R., 452
 Jefferies, P. R., 157, 179
 Jeffries, R. L., 512
 Jelinek, C. F., 535
 Jenkinson, I. S., 135
 Jenne, E. A., 535
 Jennings, R. C., 225
 Jensen, R. G., 381, 402
 Jepsen, N. M., 271
 Jerzykowski, T., 109
 Jeschke, W. D., 449
 Joaquin, J., 490
 Jockusch, H., 477
 Joham, H. E., 524
 Johansen, C., 452
 John, M. K., 536, 540, 544, 546
 Johns, G. G., 285-87, 289
 Johnson, A. D., 523
 Johnson, C. M., 526
 Johnson, D. A., 293
 Johnson, H. B., 380, 381, 384-86, 389, 397, 405
 Johnson, L., 32
 Johnson, M. S., 540
 Johnson, R. R., 293, 303
 Johnson, T. C., 31
 Johnson, W. R., 540, 543, 546
 Joliot, A., 54, 56, 57, 59, 373, 374
 Joliot, P., 54, 57, 373, 374
 Jones, B. E., 476
 Jones, G. D., 523
 Jones, G. H., 422, 424
 Jones, H. E., 534
 Jones, H. G., 290-95
 Jones, J. S., 543
 Jones, L. H., 516, 520
 Jones, L. H. P., 540, 543, 544
 Jones, L. W., 333, 349
 Jones, M. B., 388, 406
 Jones, M. G. K., 444, 447
 Jones, M. M., 289
 Jones, O. T. G., 98, 107, 113, 114
 Jones, R., 285, 287, 288
 Jones, R. G. W., 546
 Jones, R. K., 523
 Jones, T. L., 521
 Jones, U. S., 521
 Jones, W. E., 512, 513, 518, 521, 527, 529, 532-34, 541, 542, 545
 Jordan, E. H., 252
 Jordan, P. M., 99, 100
 Jordan, W. R., 289
 Joshi, G. V., 77
 Joshi, M. C., 296, 386, 387
 Jost, M., 323
 Juang, T.-C., 524
 Jurgenson, J. E., 105-7, 112
 Jurinak, J. J., 537, 543
 Jury, W. A., 284
 Jusic, M., 208
 Juttner, F., 325, 328, 330
- K
- Kaback, H. R., 445, 446, 450
 Kadzimin, S. B., 385, 386
 Kaempfer, R., 35
 Kagawa, Y., 439, 441
 Kahn, A., 115, 490
 Kaighn, M. E., 35
 Kaji, J., 171
 Kajiwaru, M., 98
 Kamienska, A., 173
 Kamiya, N., 127
 Kamprath, E. J., 512, 513
 Kamzolova, S. G., 29
 Kan, K.-S., 326, 327
 Kanai, R., 230
 Kanda, S., 300, 309
 Kandler, O., 389
 Kane, A., 28
 Kane, B. E., 474
 Kane, R., 504
 Kanemasu, E. T., 297
 Kang, B. G., 257
 Kannangara, C. G., 108, 113, 114, 223
 Kapil, R. N., 391
 Kaplan, A., 382, 387, 393
 Kaplan, J. G., 37
 Kappen, L., 35, 278, 281, 282, 288, 291, 293, 294, 298, 300, 301, 306, 387
 Karekar, M. D., 77
 Karlin, J. N., 196
 Karlson, P., 462
 Karlsson, J., 450
 Karnovsky, M. J., 496
 Karpilov, Yu. S., 230
 Kartenbeck, J., 429

- Kasemir, H., 105, 112, 113
 Kasyanenko, A. G., 218, 223
 Kataoka, H., 128
 Katchalski, E., 35
 Katchalsky, A., 126
 Katsumi, F., 544
 Katsumi, M., 162, 182
 Katsunuma, T., 208
 Katunuma, N., 210
 Katz, E., 105, 110, 112, 113
 Kauffman, S. A., 33, 35, 36
 Kausch, W., 385
 Kauss, H., 125-27, 132, 133, 135, 137
 Kautsky, H., 348
 Kawabe, S., 171, 181, 182
 Kazemie, M., 31, 36
 Keenan, T. W., 449
 Keeney, D. R., 535, 537, 544
 Kefford, N. P., 256
 Keifer, D., 445
 Keister, D. L., 269
 Kekwick, R. G. O., 226
 Keller, H. J., 126
 Kellerman, G. M., 33, 35-37
 Kelly, D. P., 67-70, 72, 75
 Kelly, G. J., 69, 77, 215, 231, 381, 394, 402
 Kelly, H., 69, 72
 Kelly, W. C., 537
 Kemper, W. D., 538
 Kendrick, R. E., 183
 Kennedy, C., 263
 Kennedy, E. P., 445, 547
 Kennedy, R. A., 87
 Kennedy, R. M., 449, 453
 Kerridge, P. C., 522
 Kersey, Y. M., 496, 504
 Kesar, M., 518, 522
 Kesseler, H., 122, 128, 131
 Kestler, D. P., 231
 Keynes, R. D., 439
 Khairi, M., 293
 Khan, A. A., 391, 394
 Khan, M. A., 300, 309
 Khan, M. S. I., 546
 Khesin, R. B., 29
 Kholmatoa, M., 220
 Khondohormoff, V. A., 69
 Khramova, G. A., 223
 Khudyakov, I. Ya., 322
 Kidby, D. K., 206
 Kikuchi, A., 30, 36
 Kikuchi, G., 98, 100, 109
 Kikuchi, T., 547
 Kiltz, H., 463, 480
 King, H. M., 439, 448, 452
 King, L. D., 542
 Kipe-Nolt, J. A., 105, 115
 Kipnis, D. M., 504
 Kirchbaum, R. M., 132
 Kirk, J. T. O., 110, 115, 217, 219, 220
 Kirk, M., 70, 76
 Kirkpatrick, H. C., 517
 Kirsch, R. K., 528
 Kirst, G. O., 126, 127, 132, 133, 386, 398
 Kishimoto, U., 124, 138
 Kisilev, O. I., 225
 Kiss, G. B., 274
 Kissel, H. J., 103, 110
 Kitagawa, Y., 526
 Kitajima, M., 349, 351-53, 355, 357, 358, 360, 361, 369
 Kittrick, J. A., 512
 Klein, A., 26
 Klein, S., 35, 48, 105, 110-13
 Klein, S. M., 226
 Klein, W. H., 110, 111
 Kleinkopf, G. E., 299, 301
 Klemke, W., 444
 Klibanov, A. M., 141
 Klierer, W. M., 530
 Klimashevskii, E. L., 514, 517-19, 521
 Klimov, V. V., 52
 Klopstech, K., 220, 225
 Kluge, M., 205, 380, 382, 384, 387, 390, 391, 393, 395, 396, 398-402
 Klyachko, N. L., 36
 Knapp, E., 490
 Kneip, T. J., 536
 Knezek, B. D., 535, 538, 541, 542
 Knight, A. H., 530
 Knipling, E. B., 122
 Knoth, R., 223
 Knox, J. R., 157, 179
 Kobayashi, J., 536
 Koch, E. J., 523
 Koch, G., 36-38
 Koch, J., 109
 KOCHERT, G., 461-86; 463, 477-79
 Kochhar, O. S., 38
 Koepp, D. E., 538, 540, 541, 543, 544
 Koffler, H., 37
 Kofman-Alfaro, S., 422, 425
 Kofranek, A. M., 516
 Kohel, R. J., 79, 82
 Kohn, G. D., 286, 289, 304
 Kok, B., 54, 61
 Komada, Y., 169
 Komor, B., 447
 Komor, E., 446, 447
 Kondorosi, A., 274
 Kononenko, A. A., 61
 Kononets, V. A., 517
 Konstantinova, T. N., 249
 Konzak, C. F., 512, 523
 Konzak, W. E., 523
 Koops, F. B. J., 435
 Koppel, D. E., 38
 Korenbrot, J. I., 439
 Korn, E. D., 496
 Kornberg, A., 429
 Kornberg, H. L., 69, 70
 Kotze, W. A., 515, 517
 Kovaleva, L. B., 230
 Kowalski, E., 103
 Kozlowski, T. T., 278, 289, 299
 Kraan, G. P. B., 48, 60, 61
 Kramer, P. J., 296, 385-87
 Krasichkova, G. V., 226
 Kratz, W. A., 74, 322
 Kraus, G. N., 347
 Krauspe, R., 220, 224, 225
 Kregenow, F. M., 126
 Kreibich, G., 35
 Kreier, K. G., 517
 Krishnan, A. I., 279, 280, 285
 Krishnan, P. S., 391, 394
 Krogmann, D. W., 327
 Kronstad, W. E., 512, 522
 Kroontje, W., 538, 543, 544
 Ku, S. B., 230
 Kuan, K. H., 521
 Kubota, J., 536
 Kuehnert, C. C., 252, 254
 Kulavea, O. N., 36
 Kulasaoriya, S. A., 324, 334, 335
 Kumakov, V. A., 228
 Kumar, A., 98, 100
 Kung, S. D., 220, 226, 233
 Kunisawa, R., 71, 326, 334
 Kunitake, G. M., 391
 Kurizama, K., 497, 505
 Kursanov, A. L., 228
 Kurz, W. G. W., 269, 271
 Kuznetsova, N. N., 517
 Kvitko, K. V., 219
 Kwanjien, P., 220, 226
 Kylin, A., 450

L

- Labbe-Bois, R., 100
 Labuza, T. P., 26
 Lacroix, L. J., 390, 405
 Lado, P., 448
 Laetsch, W. M., 230, 395, 400, 401
 Lafever, H. M., 523
 Lagerwerff, J. V., 536, 543, 544
 Lai, Y. F., 453
 Laing, D. R., 304
 Laing, W. A., 79, 82, 404

- Laisk, A. H., 232
 Lambein, F., 323
 Lambert, A. M., 38
 Lance, B., 174
 Lance, C., 198, 199
 Landau, J. V., 34-36
 Landé, M. A., 35
 Landin, M. C., 536
 Lang, A., 150, 155, 162, 175, 487, 490
 Lang, N. J., 323-25, 334, 335
 Lange, O. L., 35, 278, 281, 288, 291, 293, 294, 298, 300, 306, 382, 387
 Langford, G. M., 38
 Langley, K. H., 38
 Lanting, L., 210
 Lanyi, J. K., 446, 450
 Lapteva, T. I., 519
 Larcher, W., 25
 Larkum, A. W. D., 79
 Larson, P. R., 242-44, 258
 LaRue, T. A., 269, 271
 Lascelles, J., 105, 113
 Lasure, L., 474
 Laties, G. G., 396, 449, 451
 Latzko, E., 69, 77, 215, 231, 381, 394, 402
 Läuchli, A., 143, 197
 Lauffer, M. A., 137
 Lauppe, H., 429
 Laux, A., 504
 Lavee, S., 174, 181
 Laver, W. G., 98, 100
 Lavietes, B. B., 37
 Lavorel, J., 48, 50, 52, 53, 55-57
 Law, I. J., 502
 Lawrie, A. C., 329, 335
 Lea, P. J., 333
 Leach, C. K., 74, 75, 328
 Leach, W., 527
 Leavenworth, C. S., 396
 Lebowitz, M. M., 246
 Lee, B., 450
 Lee, C. R., 521, 524, 527, 536, 537
 Lee, D. R., 292
 Lee, J., 546
 Lee, J. A., 133, 515
 Lee, K. C., 544
 Lee, K. W., 537
 Lee, M. M. L., 38
 Lee, S. S., 327
 Lee, T., 546
 Lee, Y. C., 26, 27, 29, 30
 Leech, R. M., 218
 Leeper, G. W., 542
 Lees, H., 69
 Lehane, J. J., 302, 304
 Lehninger, A. L., 440
 Leigh, R. A., 132, 133, 195, 197, 199
 Leith, H., 278, 282
 Lelkes, P. I., 129, 134, 135, 137
 Lelong, J. C., 32
 Lemaire, I., 479
 Lemon, E. R., 293, 294
 Lengyel, J. A., 29
 Lenney, J. F., 206
 Leonard, C. D., 541
 Leonard, R. T., 448, 449
 Leopold, A. C., 160
 Lerman, J. C., 82, 386, 404-6
 Lerner, H. R., 133
 Lersten, N. R., 250
 Lester, R., 98, 111
 Letter, B. R., 36
 Leung, J. T., 504
 Levi, C., 391
 Levine, R. F., 38
 Levine, R. P., 219, 224-26
 Levinson, J. A., 481
 Levitt, J., 25
 Lew, F. T., 159
 Lewin, J., 529
 Lewin, J. C., 74
 Lewin, R. A., 75
 Lewis, C. M., 346, 359, 360
 Lewis, J. A., 35
 Lewis, R. J., 518
 Lex, M., 325, 327, 328, 332
 Ley, A. C., 365-68
 Liang, G. H., 544
 Libbenga, K. R., 493
 Libby, W. F., 141
 Lichko, L. P., 197
 Lieber, E. R., 162
 Liebig, G. F. Jr., 542, 544
 Liebisch, H. W., 173, 181, 182
 Lieu, S., 327
 Lilley, R. McC., 451
 Lin, W., 198, 199, 444, 448, 451-53
 Linask, J., 449
 Lindenmayer, A., 240, 241
 Lindsay, W. L., 535, 537-40, 544
 Lindt, J. H., 302
 Lingle, J. C., 544
 Linnane, A. W., 33, 35-37
 Linnemans, W. A. M., 206
 Lintilhac, P. M., 247
 Liorot, C., 201, 202
 Lipkind, B. I., 226
 Lipmann, F., 438
 Lischewski, M., 173, 182
 Lisk, D. J., 537
 Little, P., 536, 541
 Littleton, J. W., 217
 Litvin, F. F., 59
 Liu, M. S., 74
 Liambias, E. B. C., 101, 114
 Lloyd-Jones, C. P., 541
 Lockard, R. G., 525
 Loe, R., 527, 533, 535
 Loewenstein, W. R., 38
 Lof, H., 308, 309
 Lohr, J. B., 109
 Lomagin, A. G., 28, 34
 London, J., 74
 Loneragan, J. F., 525, 529, 538
 Long, W. S., 442, 443
 Loomis, R. S., 228, 278, 295, 297, 299, 301, 306, 308
 Lopez, A., 523
 Lorch, S. K., 323
 Lorenzi, R., 173, 182
 Lorimer, G. H., 232, 381, 391, 403
 Losada, M. A., 71, 72
 Loucks, O. L., 290-92
 Love, R., 37
 Lowe, J. F., 531
 Lozier, R., 352
 Lu, C. Y.-H., 442, 443
 Lu, P., 34, 35
 Lucas, R. E., 541, 542
 Lucas, W. J., 452
 Ludlow, M. M., 289, 293, 297, 304
 Lund, E. J., 505
 Lund, Z. F., 512
 Lunnon, M. W., 177
 Lunt, H. A., 541
 Lunt, O. R., 516
 Lurie, S., 48, 58
 Lüscher, A., 208
 Luscher, M., 462
 Lüttge, U., 125, 129-32, 136, 205, 386, 396, 397, 399, 401, 405, 438, 443, 447, 448, 451, 452
 Lynch, V. H., 47, 61, 77
 Lyndon, R. F., 246, 247
 Lynen, A., 208
 Lyon, G. L., 541
 Lyons, J. M., 34

M

- MacDonald, I. R., 451
 MacDonald, R. E., 446, 450
 Machlis, L., 463-67, 471, 472
 Machold, O., 103, 225, 226
 MacKay, D. C., 526
 MacKay, V. L., 480
 MacLennan, D. H., 396
 MACMILLAN, J., 149-92; 150, 154, 155, 157-71, 174-77, 179, 181
 Macnicol, P. K., 272

- MacRobbie, E. A. C., 134, 136, 194, 447-52
 Magalhaes, A. C., 299
 Magomedov, I. M., 230
 Maguire, M. P., 420, 421, 435
 Mahaffey, K. R., 535
 Makhmadbekova, L. M., 224
 Maksymowych, A. B., 251
 Maksymowych, R., 242, 246, 251
 Malcolm, N. L., 27, 30, 31
 Malek, F., 447
 Malkin, R., 57
 Malkin, S., 48, 52, 53, 57, 61, 349
 Malone, C., 540, 543, 544
 Mamkaeva, K. A., 322
 Mandelkow, E., 504
 Manetas, Y., 98
 Manyakov, V. F., 29
 Mar, T., 48, 61
 Marc, J., 298
 Marcelle, R., 380, 390
 Margolskee, R., 263
 Margulis, L., 218
 Marienfeld, C. J., 536
 Marin, B., 35, 198
 Markova, Yu. A., 517
 Marre, E., 35, 440, 445, 447-49, 453
 Marshall, C., 546
 Martin, B. C., 177
 Martin, M. H., 536, 541
 Martin, S. E., 36
 Martinek, K., 141
 Maschmeyer, J. R., 546
 Maser, M. D., 37
 Masoner, M., 105, 112, 113
 Masui, M., 513
 Matern, H., 206
 Mather, J., 428, 430, 431
 Mather, K., 487
 Mathews, E. K., 505
 Mathis, P., 57
 Mathys, W., 546, 547
 MATILE, Ph., 193-213; 194, 195, 197, 199, 204-9
 Matoba, T., 207, 208
 Matono, T., 534
 Matorin, O. N., 223
 Matsumoto, H., 516, 517, 519, 522
 Matsushima, S., 228
 Mattheis, J. R., 114
 Matthew, M., 103
 Mattson, S., 521
 Matuszewski, W., 109
 Mauseth, J. D., 250, 251
 Mauzerall, D., 100, 109
 Mayer, F. K., 536, 542
 Maynard, D. N., 534
 Mayne, B. C., 48, 60, 61, 231
 Maze, J., 242
 McAlister, E. D., 346
 McArthur, J. A., 227
 McAulay, A., 390, 399
 McCalla, T. M., 537
 McCauley, M. J., 521
 McClain, D., 38
 McClintock, B., 426
 McComb, A. J., 298, 301
 McComb, J. A., 269
 McCorkindale, N. J., 175
 McCormick, L. H., 518
 McCormick, W., 28, 30, 32, 33
 McCown, R. L., 279, 282, 285, 286
 McCoy, G. D., 37
 McCree, K. J., 289
 McCully, M. E., 493, 501, 502
 McDowell, R. H., 501
 McFadden, B. A., 69, 72, 73, 226
 McGhie, J. F., 174
 McGloin, M., 54
 McGowan, I. D., 542
 McGrath, T., 79, 82
 McGroarty, E. J., 37
 McGuire, A., 56
 McInnes, A. G., 164, 166
 McIntosh, P. R., 33, 35
 McKenzie, R. E., 525
 McLaughlin, A., 37, 38
 McLaughlin, C. S., 32
 McLerran, C. J., 536
 McMahon, D., 115
 McMorris, T. C., 463, 473
 McMurtrey, J. E. III, 523
 McNaughton, S. J., 546
 McNeilly, T., 540, 546
 McQuade, H. A., 433
 McVittie, A., 219
 McWilliams, E. L., 382, 383
 Meade, H. M., 274
 Mechler, B., 35
 Medappa, K. C., 515, 516
 Medina, E., 383, 387
 Meeks, J. C., 321, 325, 329, 330, 332
 Mehard, C. W., 438
 Meidner, H., 125
 Meier, D. D., 251
 Meigs, P., 277-79
 Meinzer, F. C., 386
 Mekkelholt, K., 35, 36
 Melcher, J. R., 142
 Meller, E., 105-7, 110, 112
 Melmon, K. L., 479
 Mendelson, C., 479
 Mendez, V. M., 35
 Menz, K. M., 233
 Mercer, E. I., 183
 Meredith, R., 480
 Merio, D. J., 416
 Merrett, M. J., 76
 Merry, R. H., 536
 Meselson, M. S., 417, 418
 Mets, L., 220
 Mettler, I. J., 448
 Metzger, R., 523
 Metzger, R. J., 512
 Meudt, W. J., 524
 Meyer, B., 197
 Meyer, D. R., 536, 542
 Meyer, J., 199, 206
 Mian, A. J., 503
 Michelson, A. M., 32
 Miehle, H., 488
 Miersch, O., 173, 182
 Mifflin, B. J., 333
 Miksche, J. P., 250
 Milbocker, D. C., 537, 542
 Milburn, T. R., 395
 Miles, C. A., 482
 Miles, C. D., 61
 Milhain, P. J., 517
 Millbank, J. W., 338
 Miller, A. G., 443, 451
 Miller, C. O., 256
 Miller, H. H., 26
 Miller, J. E., 538, 540, 541, 543
 Miller, J. W., 103
 Miller, M. J., 32
 Miller, O. L., 29
 Miller, P. C., 282, 286, 288, 291, 292, 294, 299, 300
 Millikan, C. R., 522, 528, 532
 Millington-Ward, A. M., 435
 Minotti, P. L., 515
 Miskin, K. E., 293
 Misra, T. N., 476
 Mitchell, P., 438, 441, 450
 Mitchell, R. L., 539, 541
 Mitchison, G. J., 240, 321-24, 333-36
 Miyachi, S., 76
 Mizuuchi, K., 428
 Moens, P. B., 433
 Mohl, R., 136
 Mok, W., 35
 Mokronosov, A. T., 232
 Mollenhauer, H. H., 504
 Moncur, M. W., 298
 Mondovi, B., 37
 Monesi, V., 415
 Money, N. S., 531
 Monier, R., 30, 36
 Montoya, A. L., 416
 Moomaw, J. C., 516
 Mooney, H. A., 278, 282, 286-88, 290-94, 297, 299-301, 309, 383, 386, 406
 Moor, H., 198, 205
 Moore, C., 424
 Mooré, D. J., 504

Moore, D. P., 512, 516, 523, 539
 Moore, R. B., 73-75, 544
 Moore, R. E., 463, 469, 470
 Moore, R. T., 282, 284, 285, 293, 297, 306, 385
 Moore, T. C., 155, 159, 160, 180, 183
 Moorman, F. R., 534
 Moradshahi, A., 387
 Morandi, C., 264-66, 332
 Moreau, F., 198, 199
 Morel, C., 398
 Morgan, P. W., 524
 Morimura, S., 516, 517, 519, 522
 Morita, R. Y., 27, 30
 Morré, D. J., 504
 Morris, H. D., 525, 542
 Morris, I., 77
 Morrow, I. B., 246
 Mortenson, L. E., 267-69, 331
 Mortimer, R. K., 417
 Mortimore, G. E., 209
 Mortvedt, J. J., 537
 Mosely, M. F. Jr., 249
 Moshkov, B. S., 228
 Moss, B., 489
 Moss, D. N., 233, 293, 303
 Most, B. H., 171
 Mott, J. J., 298, 301
 Moyses, A., 82, 386, 391, 404, 406
 Mueller, R. T., 539
 Mugwira, L. M., 514-16, 523
 Mukerji, D., 77
 Mukerji, S. K., 391, 392
 Mukhamadiev, B., 232
 Mukhamadiev, B. T., 219
 Mukherji, S., 544
 Müller, D. G., 462, 463, 468-70
 Müller, H., 195, 206
 Mulleriyawa, R. P., 533
 Mulette, K. J., 522
 Mullinger, R., 327
 Mullins, J. T., 474
 Mulroy, T. W., 282, 298, 300
 Mummert, H., 142
 Munns, D. N., 526
 Munsche, D., 220, 224, 225
 Munson, R. J., 26
 Murakami, S., 438
 Murashige, T., 244, 253
 Murata, N., 48, 57, 58, 346, 347, 355, 357
 Murata, Y., 228
 Murofushi, N., 169, 171-73, 181, 182
 Murphy, G. J. P., 159, 162, 183
 Murphy, P. J., 159
 Murphy, R. B., 141

Murphy, T. M., 490
 Musgrave, A., 474
 Musgrave, R. B., 230
 Musick, J. T., 282, 302
 Muzafarova, S., 220, 225
 Myers, J., 74, 322, 346, 359

 N
 Nadeau, R., 171, 174, 181
 Nadler, K., 110
 Nagai, T., 534
 Nagatani, H., 264
 Naidoo, G., 518
 Naiki, N., 547
 Nair, P. M., 102, 107, 114
 Nakagawa, S., 128
 Nakamura, K. D., 195, 197, 201
 Nakamura, M. T., 516
 Nakano, M., 207
 Nakazawa, S., 489, 490, 497
 Nalborczyk, E., 228, 390, 405
 Nambier, E. K. S., 513
 Nanda, K. K., 248
 Nandi, D. L., 100, 104
 Nash, C. H., 31
 Nash, H. A., 428
 NASYROV, YU. S., 215-37; 218-20, 222-24, 226-28, 232
 Naumova, L. P., 499
 Navasero, S. A., 527, 533, 535
 Naylor, A. W., 86
 Ndegwe, N. A., 395
 Neales, T. F., 294, 380, 382-84, 387
 Neely, N., 209
 Neeman, E., 105, 110, 112, 113
 Neilson, A., 326, 332-34
 Neilson, A. H., 75
 Nekrasova, G. F., 232
 Nelson, D. L., 547
 Nelson, D. R., 491
 Nelson, L. E., 513
 Nesmith, W. C., 521
 Nester, E. W., 416
 Neuberger, A., 98, 100, 103
 Nevers, P., 426
 Newbauer, B. F., 518
 Newbauer, F., 518, 522
 Newcomb, E. H., 78, 79, 391
 Newhook, F. J., 482
 Newman, E. L., 287, 289
 Newton, J. W., 333
 Newton, R. J., 87
 Nhung, Mai-Thi-My, 531, 532
 Niamien Ngoran, M., 201, 203
 Nichiporovich, A. A., 228
 Nicholas, D. J. D., 541
 Nichols, B. W., 323
 Nichols, J. M., 337
 Nicholson, J., 347

Nicolson, G. L., 141, 495, 496, 504
 Niedermeyer, W., 198
 Nielsen, N. C., 110, 112, 226
 Nielsen, O. F., 223
 Nielson, K. F., 525
 Nieuwenhuis, D., 474
 Nieuwenhuis, M., 476
 Nigon, V., 105, 111, 112
 Nikolaeva, M. I., 224
 Nilan, R. A., 222
 Nilshammar-Holmvall, M., 197
 Ninnemann, H., 433
 Nir, I., 35
 Nishida, K., 380, 391
 Nishida, M., 254
 Nishimura, M., 61
 Nishizaki, Y., 60
 Nissen, P., 449
 Niven, D. F., 446
 Nix, C. E., 221
 Nobel, P. S., 285, 286, 288, 301, 384-87, 397, 451
 Nobs, M. A., 231
 Nolan, J. R., 239
 Nolan, R. A., 474
 Nolteernsting, U., 328
 Norris, L., 69
 Norris, R. E., 69
 Northcote, D. H., 246
 Norton, C., 164-66
 Norvell, W. A., 538, 539
 Novacky, A., 444, 447
 Novák, B., 494, 504
 Novotny, A. M., 491-93, 501, 504
 Nowacki, J. A., 446
 Noy, R. J., 328
 Noy-Meir, I., 278, 283-86, 290, 297, 298, 300, 301
 Nuccitelli, R., 489, 493-95, 497, 504, 505
 Nuernbergk, E. L., 380, 384
 Nuovo, G. J., 447
 Nurse, P., 195, 196, 205, 206
 Nutting, W. H., 463-66

 O
 Oaks, A., 194
 Ochiai, H., 114
 Ochiai, S., 111
 O'Dea, M. H., 428
 Odintsova, M. C., 217
 Odurukwe, S. O., 522, 534
 Ogan, A. U., 162, 177
 O'GARA, F., 263-76; 266, 270, 271
 Ogasawara, N., 76
 Ogata, S., 71, 72
 Ogden, J., 297, 298, 302

- Ogren, W. L., 78, 232
 Ogura, K., 155
 Ohad, I., 224, 225
 Oh-hama, T., 105, 112, 115
 Ohkawa, T., 138
 Ohki, K., 526, 527
 Ohmori, M., 329
 Ohtsuru, C., 207, 208
 Okada, K., 98
 Okamoto, K., 535, 547
 Okamoto, T., 169
 Okayama, S., 56, 349, 356
 Okon, Y., 265, 266
 Okorokov, L. A., 197
 Oku, T., 59
 Okuda, A., 529
 Okuyama, M., 109
 Oleinick, N. L., 34
 Olive, L. S., 480
 Oliver, J. M., 496
 Olsen, C., 534
 Olsen, S. R., 532, 539
 Oltmanns, F., 489
 Oppenheimer, H. R., 298-300
 Ordal, Z. J., 29, 30
 Orenstein, J. M., 37
 Ormerod, J. G., 69, 71, 73
 Ormerod, K. S., 71
 Ormrod, D. P., 542
 Orr, J., 325, 332, 338
 Orshan, G., 282, 288, 299, 300
 Osada, H., 171-73, 181, 182
 Osawa, T., 528
 OSMOND, C. B., 379-414; 79,
 102, 133, 281, 282, 285, 290,
 294, 307, 380-82, 384, 386,
 387, 389-92, 394-96, 398-403,
 405, 406, 451
 Oster, M. O., 155
 Ostlund, R. E., 504
 Ota, 521
 O'Toole, K., 33, 35
 Otsuka, K., 521
 Ouellette, G. J., 516, 526
 Overstreet, R., 439, 448, 452
 Overton, J. B., 490
- P**
- Pacini, E., 504
 Packer, L., 438
 Pagan, J. D., 269
 Page, A. L., 537, 538, 544
 Page, N. R., 537
 Palevitz, B. A., 491, 492, 496,
 504
 Pallaghy, C. K., 451
 Palm, P., 29
 Palmer, J. H., 298
 Palta, J. P., 136, 137
 Pamplin, E. J., 105
 Panzica, G., 207
 Panzica-Viglietti, C., 207
 Paolillo, D. J., 252
 Papian, L. E., 290-92
 Pardee, A. B., 37
 Pardue, M. L., 28, 29
 Parejko, R. A., 264
 Parish, G. R., 198
 Parish, R. W., 207
 Park, F., 546
 Park, R., 79, 81
 Parker, J. S., 422
 Parker, P. L., 78, 82, 85
 Parkhurst, D. F., 290-92
 Parson, W. W., 48, 50-52
 Parthier, B., 220, 221, 224, 225
 Pascher, A., 472
 Paschinger, H., 450
 Passioura, J. B., 283, 289, 301,
 303, 304, 308
 Patel, K. I., 516, 523
 Patel, P. M., 539
 Patel, S. V., 514, 515
 Patil, B. A., 77
 Patrick, W. H., 525
 Patterson, A. A., 294, 384
 Patterson, D., 27, 29, 30
 Patterson, J. B. E., 537
 Patterson, R., 168, 174, 181,
 226
 Patterson, R. J., 168
 Paulsen, G. M., 544
 Pavlasová, E., 449
 Pavlova, S. E., 517
 Pearce, J., 75
 Pearce, R. B., 300
 Percy, R., 231
 Pearson, D. J., 395
 Pearson, H. W., 331
 Pearson, R. W., 512
 Peaslee, D. E., 529
 Pelroy, R. A., 74, 75
 Peng, H. B., 490, 493, 495
 Penman, S., 28, 30, 32-34
 Penning de Vries, F. W. T.,
 295
 Penth, B., 452
 Percival, E., 501, 503
 Perhac, R. M., 536
 Perkins, H. F., 532, 533, 537
 Perkins, H. J., 102
 Perry, R. P., 30, 32
 Pesant, A. R., 525
 Peskin, A., 263
 Peters, G. A., 337, 338
 Peters, T. L., 74
 Peterson, D. M., 490
 Peterson, J. R., 537
 Peterson, L. A., 515, 542, 544
 Peterson, L. W., 209
 Peterson, P. J., 541, 546
 Peterson, R. B., 322, 325, 331
 Peterson, R. G., 528
 Peterson, R. L., 257
 Petraglia, T., 448, 451, 452
 Pfennig, N., 69, 72, 73
 Pham Thanh Ho, 219
 Pharis, R. P., 164, 166, 169,
 171, 173, 174, 181
 Philip, J. R., 129
 Phillips, D. O., 337
 Phillips, P. E., 536
 PHINNEY, B. O., 149-92; 154,
 155, 157, 158, 162-66,
 174-77, 179, 180
 Pickard, B. G., 136
 Pickett-Heaps, J. D., 246
 Pierce, J. O., 536
 Pierce, W. S., 449
 Pierpont, R. A., 515
 Pierre, W. H., 525
 Pieters, W. H. J., 523
 Pietrzyk, C., 439
 Pike, C. S., 541
 Pilger, D., 225
 Pilwat, G., 128, 137-39
 Pinaev, G., 36
 Pinkhasov, Yu. I., 232
 Piñon, R., 417, 433
 Pitel, D. W., 164
 Pitman, M. G., 134, 438, 443,
 447-50
 Pitot, H. C., 33, 35, 36
 Pitt, D., 194
 Plantefol, L., 240
 Plaut, W., 217
 Plempel, M., 475
 Plessner, O. E., 448, 452
 Pluscec, J., 103, 109
 Pogo, A. O., 35
 Pokorny, V., 198
 Polacco, J. C., 545
 Poljakoff-Mayber, A., 35, 382,
 387, 393
 Pollard, A., 132, 133
 Pollard, T. D., 495-97, 504
 Polle, E., 512
 Polson, D. E., 542, 545
 Polya, G. M., 451
 Ponnampetuma, F. N., 531,
 532
 Ponsana, P., 287, 289, 301
 Poo, M.-M., 495, 505
 Poole, D. K., 286, 288, 299
 POOLE, R. J., 437-60; 440,
 448, 450-52
 Pope, D. H., 34-36
 Popham, R. A., 249
 Porra, R. J., 101, 106, 112
 Porritt, S. W., 526
 Porter, K. R., 38
 Posluszny, U., 240
 Postgate, J. R., 268, 269
 Potter, J. E. R., 37

- Powell, J. B., 292
 Power, J. F., 282, 286, 304, 306
 Powers, W. L., 297
 Prat, R., 195
 Pratt, H., 31
 Precht, H., 25
 Pohn, S., 30
 Presad, M., 515
 Prescott, D., 38
 Pressland, A. J., 282, 285, 288
 Pressman, E. K., 499
 Prestes, A. M., 523
 Price, C., 546
 Prieto, A., 476
 Pringle, J. R., 208
 Pritchard, R. H., 420
 Proctor, J., 536, 540, 542, 543, 546
 Pryce, R. J., 150, 171
 Pucher, G. W., 396
 Puchkova, L. V., 225
 Pugh, T. D., 391
 Puisieux-Dao, S., 498
 Pujarniscle, S., 195, 198
 Pulich, W. M., 75
 Pulles, M. P. J., 50, 56, 57
 Purves, D., 532, 537
 Putnam, E. W., 513, 531, 533
 Putnam, A., 524
 Putwain, P. O., 540
- Q**
- Quader, H., 133
 Quarrie, S. A., 476
 Quastel, M. R., 37
 QUATRANO, R. S., 487-510;
 489-93, 496, 501-3, 505
 Quayle, J. R., 73
 Queiroz, O., 387, 388, 397-99,
 401, 403, 405, 406
 Quine, M. P., 333-35
 Quinn, J. A., 546
 Quispel, A., 271
- R**
- Raat, A. J. P., 327
 Rabinovitch, M., 32
 Rabinovitch, S., 127, 128
 Rabussay, D., 29
 Racker, E., 37, 438, 439
 Racusen, R. H., 447
 Radding, C. M., 417, 418
 Råde, H., 124, 125
 Radzhavov, H., 220
 Railton, I. D., 150, 169, 174
 Rains, D. W., 449, 544
 Raison, J. K., 33, 35-37, 225
 Rajagopal, C. K., 531
 Raju, M. V. S., 242, 249, 256
 Ramaswamy, N. K., 102, 107,
 114
 Rammanis, L., 219
 Rand, R. P., 126
 Ranson, S. L., 380, 386-90,
 392, 394, 402
 Rao, K. K., 327
 Rao, P. V., 523
 Raper, J. R., 462, 465, 473,
 480
 Rapoport, H., 463-66
 Rapoport, S. I., 442
 Rapoport, S. M., 30
 Rappaport, L., 168, 171, 174,
 181
 Raschke, K., 134, 287
 Rasi-Caldogno, F., 448
 Rasmussen, H. P., 518
 Rasmussen, P. E., 542
 Rasmussen, S. W., 420
 Rasmussen, D. C., 293
 Ratajczak, T., 179
 Ratliff, L. F., 512
 Ratner, A., 449, 450
 Ratner, E. I., 521
 Raven, J. A., 76, 78, 84, 85,
 395, 396, 449-51, 514, 515
 Ravser, W. E., 546
 Rawitcher-Kunkel, E., 463, 472
 Rawlins, S. L., 301
 Rawson, H. M., 291-95
 Ray, T. B., 231
 Read, D. W. L., 296
 Rebeiz, C. A., 96, 113, 114
 Rebeiz, C. C., 114
 Reboud, J. P., 31
 Rebound, A. M., 31
 Reddy, P. M., 333, 336
 Reddy, R. S., 536
 Redmann, R. E., 282, 287
 Reed, M. L., 76, 230, 232
 Reed, W., 463, 471
 Reeve, D. R., 171, 181
 Reeves, R. D., 546
 Reeves, S. G., 327
 Reger, B. J., 225
 Reibach, P. H., 80, 82
 Reicosky, D. C., 287
 Reid, D. A., 514, 522, 523
 Reid, D. M., 171, 174, 181
 Reid, I. D., 480
 Reid, I. M., 35
 Reilly, A., 542, 546
 Reilly, C., 542, 546
 Reimann, B. E. F., 529
 Reiskind, J. B., 474
 Reith, J. W. S., 541
 Rempan, J., 225
 Renger, G., 56
 Renthal, R., 446, 450
 Retief, Y., 26
 Reuss, J., 537
 Reuther, W., 537, 541
 Reyngoud, D. J., 476
 Reynolds, R. J., 221
 Rhoades, E. D., 280, 284-86
 Rhoades, M. M., 424
 Rhoads, D. B., 446
 Rhoads, F. M., 532, 533
 Rhue, R. D., 516, 517, 521
 Ribailier, D., 197, 198, 201
 Rich, A., 34, 35, 496
 Rich, P. M., 110, 111
 Richard, F., 105, 111, 112
 Richards, F. J., 240, 241
 Richards, G. P., 122, 130
 Richards, J. L., 443, 444
 Richardson, C. W., 280, 284-86
 Richert, D. A., 109
 Rickards, R. W., 157
 Rickenbacher, R., 195
 Ridley, S. M., 218
 Riedel, G. E., 263
 Riego, D. C., 520
 Riemann, F., 128, 137-39
 Rigopoulos, N., 69, 72
 Rigaud, J., 272, 273
 Rijken, A. H. G. C., 244
 Riley, R., 416, 433
 Rinne, R. W., 71, 72
 Ripley, E. A., 282, 287
 Rippka, R., 75, 322, 325-27,
 331, 332, 334
 Ris, H., 217
 Risius, M. L., 539
 Ritchie, J. T., 280, 284-87, 289
 Robbins, P. W., 36
 Robbins, W. J., 251
 Robelin, N., 302
 Roberts, D. W. A., 102
 Roberts, E., 497, 505
 Roberts, M., 502, 503
 Roberts, P. A., 424
 Robertson, J. G., 271, 273, 274
 Robertson, R. N., 451, 452,
 454
 Robinson, D. B., 523, 524
 Robinson, D. R., 155, 158
 Robinson, K. R., 489, 490, 494,
 495, 505
 Robinson, R., 331
 Robson, A. D., 525, 529
 Rocovich, S. E., 545
 Rodgers, G. A., 338
 Rodriguez-Tormes, F., 524
 Roeder, D., 546
 Roelofsen, B., 141
 Rogers, E., 532
 Rogers, L. J., 155, 183
 Rokosh, D. A., 271
 Roland, J. C., 195
 Rolfe, G. L., 544
 Roman, H., 427

- Romney, E. M., 539
 Roomans, G. M., 198
 Root, R. A., 541, 543, 544
 Ropers, H.-J., 150, 160
 Rorison, I. H., 514, 515, 544
 Rosen, J. A., 541
 Rosenberg, B., 476
 Rosenheck, K., 139
 Rosenthal, S., 30
 Rosenthal, L. J., 30, 36
 Rosenvinge, M. L., 489
 Ross, C., 452
 Ross, I. S., 547
 Roth, J. A., 541
 Rothstein, A., 439, 448
 Rotilio, G., 37
 Rotter, M., 447
 Rouhani, I., 82, 397, 402, 405
 Round, F. E., 489
 Rouse, R. D., 544
 Roux, E., 98
 Rowe, J. W., 150
 Rowell, P., 263, 265, 266, 328,
 332, 333, 338
 Rowlands, J. R., 35
 Roy, H., 226
 Royle, D. J., 482
 Rozacky, E., 530
 Rubin, A. B., 61, 223
 Rubin, G. M., 28, 29
 Rubinstein, B., 447
 Ruby, R. H., 58
 Rücker, W., 102
 Ruddat, M., 162, 175
 Ruesink, A. W., 196
 Rumley, M. K., 445
 Rundel, P. W., 282, 298, 300,
 386
 Rungie, J. M., 453
 Rusch, H. P., 26, 30
 Rush, S. G., 539, 544
 Russell, A. D., 29
 Russell, C. S., 98, 103, 106
 Russell, G., 300
 Rutter, A. J., 283, 285, 287,
 289
 Ruzicka, L., 157
 Ryan, J. A., 537, 544
- S
- Sabatini, D., 35
 Sabatini, D. D., 35
 Sabey, B. R., 537, 538, 544
 Saborio, J. L., 37
 Sackett, W. M., 70, 73, 77, 79,
 80, 82, 83, 390, 404
 Saddler, H. D. W., 444, 449,
 452
 Sadler, W. R., 72, 73
 Saedler, H., 426
- Sager, R., 219, 225
 Saheki, T., 206, 208
 Sakano, K., 220, 226
 Salomon, K., 102
 Salter, P. J., 302-4
 Saltman, P., 391
 Salts, Y., 433
 Sanada, Y., 391
 Sandakchiev, L. S., 499
 Sanderson, J. Jr., 519
 Sandland, R. L., 523
 Sane, P. V., 58-60
 Sankhla, N., 102
 Sano, S., 100
 San Pietro, A., 327
 Santarius, K. A., 34
 Santillian-Medrano, J., 537, 543
 Sanwal, G. G., 391, 394
 Sapora, O., 32
 Sarid, S., 35
 Sarma, D. S. R., 35
 Sarnoski, J., 38
 Satarova, N. A., 35
 Satelle, D. B., 38
 Satoh, K., 353, 355, 360
 Sauer, K., 56, 57, 61
 Saul, J. T., 544
 Saunders, G. F., 31, 32, 36
 Saunders, P. F., 173, 183
 Sawhney, N., 248
 Sawhney, S., 248
 Scacchi, A., 448
 Scallen, T. J., 160
 Scannerini, S., 207
 Scarborough, G. A., 442, 445,
 449, 453
 Schachner, M., 29
 Schaefer, N., 448
 Schatten, G., 38
 Schaub, H., 387
 Schechter, I., 155
 Schechter, V., 488
 Schellenberg, M., 199, 206
 Scherrer, K., 27, 29
 Schertz, K. F., 289
 Schiebel, W., 30
 Schiereck, P., 326, 327
 Schiff, J. A., 111, 112, 217,
 218, 221, 225
 Schiller, W., 545
 Schimke, R. T., 209
 Schlegel, H. G., 272
 Schlenk, F., 195, 197, 201
 Schlessinger, J., 38
 Schlossberg, M. A., 109
 Schmid, D., 58
 Schmid, R., 382, 387, 390, 391
 Schmid, W. E., 544
 Schmitz, J., 546
 Schneider, G., 173, 182
 Schneider, H. A. W., 101, 105,
 110, 114, 115
- Schneider, K., 272
 Schobert, B., 133
 Schochetman, G., 30, 32
 Scholander, P. F., 122
 Schoser, G., 498
 Schött, E. G., 208
 Schött, H. E., 208
 Schötz, F., 197
 Schou, L., 77
 Schrader, L. E., 515
 Schreiber, K., 171, 173, 176,
 181, 182
 Schröter, K., 143, 197
 Schubert, K. R., 267, 272, 273
 Schultz, S. G., 439
 Schulz, J., 128, 139
 Schulze, E. -D., 35, 278, 281,
 282, 288, 291, 293, 294, 298,
 300, 301, 306, 387, 406
 Schumacher, W., 497
 Schurmann, P., 72, 73
 Schuster, M. W., 160
 Schutz, G., 474
 Schwabe, W., 242
 Schwarcz, S., 108, 113, 114
 Schwartz, J., 35
 Schwartz, J. W., 523, 525, 527
 Schwartzbach, S. D., 111, 112,
 221
 Schwarz, J. R., 35
 Schweiger, H. G., 220, 225
 Schwencke, J., 197, 198, 200,
 202
 Sciaky, D., 416
 Scott, A. I., 98
 Scott, B. I. H., 135
 Scott, D. B., 273, 274
 Scott, J. F., 429
 Scott, J. R., 78, 79, 82, 83, 85
 Scott, N. S., 220
 Scott, R. J., 87
 Scott, T. K., 135
 Scowcraft, W. R., 269
 Scudder, G. K. Jr., 541
 Seaston, A., 195, 201, 446
 Seferiadis, K., 469
 Sega, G. A., 422
 Seibel, H. D., 541
 Seifert, W., 29
 Sembdner, G., 171, 173, 176,
 181, 182
 Senger, H., 105, 112
 Seshadri, R., 463, 473
 Sessoms, A. H., 479
 Sestak, Z., 219
 Sethi, V. S., 29
 Seto, S., 155
 Seveus, L. A., 198
 Shabde, M., 244, 253
 Shaffer, P. W., 321, 322, 325,
 329, 330, 332
 Shagadaeva, L. M., 224

- Shah, S. P. J., 183
 Shahak, Y., 60, 61
 Shanani, L., 278, 284, 298, 300
 SHANNMUGAM, K. T.,
 263-76; 72, 73, 263-71, 332
 Sharma, C. P., 528, 544
 Sharpless, R. G., 541
 Shaw, B. D., 271
 Shaw, E. R., 48
 Shcherbakova, I. Yu., 223, 226
 Shear, C. B., 515, 517
 Shechter, I., 155, 180
 Shelton, E., 37
 Shemin, D., 98, 100, 103, 104,
 106
 Shemyakin, M. F., 29
 Shepard, J., 421, 433
 Sheriff, D. W., 293
 Sherman, F., 424
 Sherman, G. D., 516
 Sherwood, H. K., 58
 Sherwood, W. A., 475
 Shibata, H., 114
 Shibata, K., 58-60
 Shieh, Y. J., 450
 Shields, D., 28, 29
 Shigematsu, I., 536
 Shimizu, M., 61, 264
 Shinitzky, M., 37
 Shinka, T., 155
 Shiozawa, J. A., 326, 327
 Shires, T. K., 33, 35, 36
 Shmulevskaya, T. A., 519
 Shoji, A., 171
 Shon, M., 29
 Shropshire, F. M., 278, 282,
 288, 290, 292, 300
 Shuman, L. M., 529, 545
 Shuvalov, V. A., 48-50, 52, 59,
 60
 Sibley, C. H., 474, 479
 Siderer, Y., 60, 61
 Sidransky, H., 35
 Siegel, S. M., 196, 542
 Siegelman, H. W., 195, 197-99,
 208, 453
 Sievers, A., 143, 197
 Sigartakie, E., 206
 Signer, E. R., 274
 Sillman, A., 504
 Silver, J. C., 473, 474
 Silverberg, B. A., 547
 Silvester, W. B., 322, 337
 Simard, R., 27-29
 Simchen, G., 433
 Simcox, D. P., 180, 183
 Simon, E., 544, 545
 Simon, M., 30, 37
 Simon, P. W., 541
 Simon, R. D., 323, 324, 326,
 327
 Simons, H. L., 374
 Simpson, J. R., 133
 Simpson, M., 502
 Sinclair, N. A., 27, 31
 Sinclair, T. R., 293, 294
 Singer, R. A., 75
 Singer, S. J., 141
 Singh, K. K., 534
 Singh, R., 541
 Singh, R. P., 524
 Singh, Y. D., 524
 Sinnott, E. W., 488, 489, 497
 Sinskey, A. J., 26
 Sippel, A. E., 474
 Sirevag, R., 69, 70, 72, 73
 Sironval, C., 494, 504
 Sisakyan, N. M., 217
 Sisler, E. C., 69, 70, 110, 111
 Sitton, D., 158
 Sivasubramaniam, S., 516, 520,
 534
 Skeen, J. R., 532
 Skoog, F., 249, 251, 256
 Skulachev, V. P., 438
 Slack, C. R., 69, 87, 230, 231
 Slade, E. A., 536
 Slatyer, R. O., 278-80, 282-85,
 291-94, 296, 297, 302, 306,
 309, 380, 391
 Slayman, C. L., 439, 440, 442,
 443, 446, 448-50
 Slayman, C. W., 442, 446, 448,
 449
 Sloodmaker, L. A. J., 523
 Small, J., 520
 Smiley, R. W., 538
 Smillie, R. M., 69, 70, 72, 79,
 110, 112, 220, 225, 230
 Smirnoy, A. M., 521
 Smith, A. J., 74, 326
 Smith, B. B., 113, 114
 Smith, B. N., 78-80, 82, 85
 Smith, D., 525
 Smith, D. G., 164, 166
 Smith, D. L., 498
 Smith, F. A., 395, 396, 443,
 450, 452, 514, 515
 Smith, H., 157, 183, 398
 Smith, J. B., 442
 Smith, L. A., 267, 268
 Smith, P. F., 537, 541
 Smith, R., 473
 Smith, R. C. G., 285-87, 289
 Smith, R. H., 244, 253
 Smith, R. J., 321-24, 333-36
 Smith, R. V., 328, 331
 Smith, R. W., 37
 Smith, T., 166, 174
 Smith, W. P., 35, 36
 Smyth, D. R., 424, 425
 Snow, M., 240
 Snow, R., 240
 Söll, D., 32
 Somers, G. F., 387
 Sone, N., 439, 441
 Song, L. C., 278, 282, 288, 290,
 292, 300
 Sonneveld, C., 527
 Sorger, G. J., 497
 Soriano, R. Z., 37
 Soufi, S. M., 539
 Souto, S. M., 527, 530
 Sowell, W. F., 544
 Spalla, C., 476
 Spanswick, R. M., 136, 440,
 442, 443, 445, 448, 449,
 451
 Spear, I., 388
 Specht, A. W., 536, 541
 Specht, R. L., 285, 287, 288,
 306
 Spector, C., 162
 Spek, J., 505
 Spencer, T., 498
 Spencer, W. F., 541, 542
 Sponset, V. M., 150, 155, 158,
 169, 170, 179, 181
 Spooner, T., 111
 Sporne, K. R., 516
 Spradling, A., 28
 Sprechman, L. M., 30, 32, 34
 Spudich, J. A., 497, 504
 Stacy, W. T., 48
 Stadelmann, E. J., 122, 136,
 137
 Staker, E. V., 536
 Stampfer, M. R., 474, 479
 Stanhill, G., 282
 Stanier, R. Y., 71-75, 321, 322,
 331, 332
 Stanley, R. A., 86
 Stanley, S. O., 329, 332
 Stanton, F. W., 123
 Staple, W. J., 302, 304
 Staring, G. J., 278
 Starling, E., 462
 Starling, T. M., 523
 Starr, R. C., 463, 465, 477,
 478, 480
 Stebbins, G. L., 245
 Stebbins, N., 447
 Steemann Nielsen, E., 86
 Steemers, R. G., 60, 61
 Steeves, T. A., 240, 252-56
 Stegeman, W. J., 113, 225
 Stein, O. L., 250
 Steinback, E., 463, 471
 Steinitz, B., 448, 451
 Stelter, W., 449
 Stephan, U. W., 103
 Stepka, W., 77
 STERN, H., 415-36; 416-21,
 423-25, 428-30, 433, 435
 Sternglanz, R., 429
 Sternweis, P. C., 442

- Steudle, E., 122-25, 127-31, 134-40, 142
 Stevens, P. T., 493, 501
 Stevens, S. E. Jr., 105, 115
 Steward, F. C., 248
 Stewart, G. R., 133, 515
 Stewart, I., 541
 Stewart, J. C., 164, 165
 Stewart, J. McD., 518
 Stewart, W. D. P., 263, 265, 266, 321, 325, 327-29, 331-33, 335, 338
 Stichler, E., 256
 Stichler, W., 406
 Stiehl, H. H., 56
 Stiles, J. I., 248
 Stiller, M. L., 389
 Stobart, A. K., 103, 106, 114
 Stocker, O., 300, 301
 Stockwill, C., 546
 Stoddart, J. L., 183
 Stokes, P. M., 547
 Stokstad, E. L. R., 109
 Stolp, C. F., 174, 181
 Stone, J. F., 278, 308
 Stonier, T., 524
 Storey, R., 132, 133
 Stötzler, D., 463, 480
 Stouthamer, A. H., 268
 Strand, J. A., 450
 Strange, R. E., 29
 Strasser, R. J., 357-65, 369, 370, 372, 374-76
 Street, J. J., 537, 538, 544
 Strehler, B. L., 47, 48, 61
 Streicher, S. L., 263, 265, 266, 332
 Strijdom, B. W., 502
 Strom, R., 37
 Struckmeyer, B. E., 542, 544
 Struik, G. J., 301, 305
 Stryker, R. B., 518
 Stumm, C., 466
 Sturani, E., 35
 Sturgis, T. C., 536
 Subramanian, K. N., 205
 Suchting, H., 516
 Suehisa, R. H., 513, 531, 533
 Sueoka, N., 217
 Sugiyama, T., 395, 400, 401
 Sumida, M., 35
 Sundberg, I., 197
 Sundeen, J., 473
 Surzycki, S. J., 224
 Sussex, I. M., 240, 252, 254-56, 490
 Sutcliffe, J. F., 530
 Sutcliffe, M., 546
 Sutherland, J., 304
 Sutherland, R. B., 474
 Sutter, R. P., 476, 477
 Sutton, B. G., 387, 389, 393, 394, 399, 402, 404-6
 Sutton, W. D., 271
 Suzangar, M., 37
 Suzuki, I., 69
 Suzuki, M., 535, 547
 Svetailo, E. N., 217
 Svihla, G., 195, 197
 Swader, J. A., 544
 Swartz, R. W., 35, 36
 Sweers, H. E., 53, 348, 352
 Sweeton, F. H., 536
 Swenberg, C. E., 48
 Switzer, R., 476
 Sypher, P. S., 31
 Syrett, P. J., 76
 Szarek, S. R., 380-82, 384-86, 389, 397, 405, 406
 Sze, H., 449, 453
 Szmelcman, S., 482
 Szot, Z., 103
- T
- Tabezawa, K., 544
 Tabita, F. R., 69, 72, 73, 75, 226
 Tadano, T., 513, 531-33, 535
 Tadmor, N., 278, 284, 298, 300
 Tai, F. H. M., 544
 Tait, G. H., 101, 103
 Takabe, T., 69
 Takacs, B., 431
 Takahama, U., 61
 Takahashi, E., 516, 517, 519, 522, 529
 Takahashi, N., 150, 171-73, 181, 182
 Takano, Y., 300, 309
 Takeba, G., 162
 Takijima, Y., 544
 Takimoto, A., 162
 Talibudeen, O., 516, 520, 534
 Talmage, P., 98, 100
 Talpasayi, E. R. S., 333, 335, 336
 Tamari, K., 171
 Tamura, S., 158, 181
 Tamura, T., 536
 Tan, K. K., 391
 Tanaka, A., 527, 531, 533, 535
 Tannenbaum, M., 38
 Tannenbaum, S., 38
 Tanner, C. B., 284
 Tanner, W., 207, 446, 447, 453
 Taper, C. D., 527
 Tashiro, Y., 35
 Tata, J. R., 28, 29
 Tataka, V. G., 58-60
 Taylor, A. W., 520
 Taylor, D., 476
 Taylor, D. M., 524
 Taylor, H. M., 512
 Tazawa, M., 124, 127, 128
 Teare, I. D., 297
 Tease, C., 422
 Tecce, G., 32
 Telfer, A., 327, 347
 Tel-Or, E., 321, 325, 327, 331
 Temper, E. E., 219
 Teng, D., 103
 Teng, D. M., 103
 Tennigkeit, J., 333
 Terasima, T., 26
 Terry, N., 524
 Teulings, F. A. G., 268
 Tewari, C. P., 391, 394
 Tewari, K. K., 217, 220
 Thawornwong, N., 513, 520
 Thayer, G. W., 78
 Thenabadu, M. W., 531
 Thiéry, J., 39
 Thimann, K. V., 388
 Thoman, M., 38
 Thomas, D. des S., 474
 Thomas, D. E., 524
 Thomas, D. M., 477
 Thomas, J., 321, 325, 326, 329-32
 Thomas, M., 380, 386-89, 392, 402
 Thompson, A. H., 523
 Thompson, J., 47, 48
 Thompson, J. E., 453
 Thompson, J. F., 540
 Thornber, J. P., 326, 327, 353
 Thorne, G. N., 228
 Thornley, J. H. M., 240
 Thorpe, T. A., 174, 251
 Thrall, D. E., 37
 Thurman, D. A., 547
 Tiffin, L. O., 520, 530, 539, 540, 544
 Tigier, H. A., 101, 114
 Tiller, K. G., 536, 538
 Tilney, L., 504
 Tilney-Basset, R. A. E., 219, 231
 Timberlake, W. E., 473, 474
 Ting, I. P., 285, 288, 290, 292-94, 380-82, 384-86, 389, 391, 392, 397, 399, 405, 406
 Tjepkema, J., 269
 Toan, N. D., 325, 332, 338
 Toda, S., 535, 547
 Tokuda, H., 446, 450
 Tolbert, N. E., 69, 77, 232
 Tollin, G., 57, 58
 Tolmach, L. J., 26
 Tomkins, G. M., 479
 Tomlins, R. I., 29, 30

- Tomlinson, P. B., 240
 Tonk, W. J. M., 443
 Tooze, J., 37
 Torikai, H., 519
 Torrey, J. G., 254, 256, 490, 491
 Torsell, B. W. R., 280, 290
 Tosteson, D. C., 126
 Towers, N. R., 33, 35-37
 Townsend, C. A., 98
 Townsend, J. R., 515
 Towsey, M. W., 86, 87
 Trebst, A., 215, 438
 Trebst, A. V., 71, 72
 Tregunna, E. B., 79
 Treharne, K. J., 230
 Treichel, S., 132, 133, 386, 398
 Trierweiler, J. F., 538
 Trim, A. R., 514
 Trimbom, P., 406
 Trlica, M. J., 282, 306
 Trocne, S., 542
 Troke, P. F., 133
 Trost, J. F., 521
 Troughton, J. H., 70, 73, 79, 82, 83, 85, 382-84, 386, 387, 404-6
 Trouslot, P., 198
 Troxler, R. F., 98, 105-7, 111, 112
 Truper, H. G., 69
 Tsai, L.-B., 331
 Tsubo, Y., 463, 464
 Tsuki, S., 109
 Tsunoda, S., 300, 309
 Tsuruhara, T., 479
 Tubb, R. S., 266
 Tugarinov, V. V., 219
 Tunstall, B. R., 282, 288, 299, 300
 Turishcheva, M. S., 217
 Turner, G. L., 263, 269-73
 Turner, J. M., 103
 TURNER, N. C., 277-317; 278, 287, 289, 294, 295, 297-99, 302, 303, 308, 385, 397
 Turner, R. G., 536, 545, 546
 Tvoros, E. K., 35
 Tyankova, L., 34
 Tyree, M. T., 122, 123, 130
- U**
- Uerlings, I., 35
 Uhring, J., 421
 Ukena, T., 496
 Ulane, R., 206, 208, 500
 Ulane, R. E., 500
 Ulmasov, Kh. A., 232
- Ulmer, D. D., 535
 Ulrich, F., 36, 38
 Ulugbekova, G., 220
 Upper, C. D., 155, 158, 159
 Uriu, K., 301
 Usmanov, P. D., 219, 222, 223, 232
- V**
- Vaishnav, P. P., 524
 VALENTINE, R. C., 263-76; 263, 264, 266-68
 Vallee, B. L., 535, 544
 Van, T. K., 85, 86
 Van Baalen, C., 75
 Van Bavel, C. H. M., 289
 Van Best, J. A., 51-54, 56, 57
 van Boekel-Mol, T. N., 400
 Van Dam, K., 442
 van Deenen, L. L. M., 141
 Vandenberg, P. J., 518, 519, 522
 Van den Briel, M. L., 476
 van den Driessche, R., 282, 299, 300
 Van den Ende, H., 462, 463, 476, 477
 Vanderhoef, L. N., 544
 van der Mark-Iken, C., 435
 Van der Schatte Olivier, T. E., 51
 Van der Wilden, W., 199, 206
 van der Woude, W. J., 504
 Van de Stadt, R. J., 442
 Van Diest, A., 513, 520
 Van Goor, B. J., 530
 VAN GORKOM, H. J., 47-66; 50, 56, 57, 61, 327, 331
 van Heemst, H. D. J., 278
 Van Huystee, K. B., 101, 105
 van Keulen, H., 280, 283, 284, 286, 296, 297, 301, 305, 308, 309
 VanLaerhoven, C. J., 536, 544, 546
 van Niel, C. B., 68
 Van Rijn, H. J. M., 206
 Vanselow, A. P., 542, 544
 van Tienhoven, M., 542, 544
 Van Tuil, H. D. W., 515
 Van Went, J. L., 504
 Vasconcelos, A. C., 221, 226
 Vassalli, P., 35
 Vater, J., 56
 Vaughan, B. E., 450
 Veen, A. H., 240, 241
 Velthuys, B. R., 50, 51, 54, 55, 57, 60, 61
 Venediktov, P. S., 61
 Vergnano, O., 536, 542
- Verity, D., 406
 Vermiglio, A., 57
 Verney, E., 35
 Vernon, L. P., 48, 226
 Verrill, D. B., 518
 Vickers, J. C., 522
 Vickery, H. B., 396
 Viera da Silva, J., 299
 Vieira de Silva, J. B., 35
 Vieweg, G. H., 393
 Villigarcia, S., 518
 Vincze, E., 274
 Vines, H. M., 82, 387, 391, 397, 398, 402, 405
 Vining, L. C., 164, 166
 Vinograd, J., 428
 Visser, J. W. M., 57, 58, 374
 Vlamis, J., 521, 526, 529
 Vöchting, H., 488
 Vogel, W. G., 525
 Volk, R. J., 69
 Vollard, C., 100
 Vollet, J. J., 38
 Vollmer, A. T., 299, 301
 Von Alphen-Van Waveren, O., 353, 355
 von Eichmann, M., 382, 387
 von Wettstein, D., 110, 112, 115, 223, 435
 Von Willert, D. J., 386, 398
 Voogt, S. J., 527
 Voorn, G., 353, 355
 Vorisek, J., 198
 Vos, J., 497, 505
 Vosberg, H. P., 428
 Voskresenskaya, N. P., 76, 223
 Vredenberg, W. J., 443
 Vreugdenhil, D., 493
- W**
- Waaland, S. D., 488
 Waggoner, P. E., 294
 Wagner, G., 504
 Wagner, G. J., 195, 197-99, 208, 453
 Wahal, C. K., 335
 Wahba, A. J., 32
 Waines, J. G., 289, 299, 309
 Wainwright, S. J., 545-47
 Waisel, Y., 518
 Walker, B. H., 284
 Walker, D. A., 76, 230, 389, 394, 398, 402
 Walker, N. A., 134, 443, 450, 452
 Walker, R., 247
 Walkinshaw, C. H., 197
 Wall, J. D., 267
 Wallace, A., 532, 539, 544

- Wallace, T., 536, 542
 Walles, B., 221
 Walley, K. A., 546
 Wallihan, E. F., 541
 Walsby, A. E., 123, 323, 325, 331
 Walsh, L. M., 541
 Walsh, R. J., 37
 Walter, H., 279, 282, 284, 288, 299
 Wample, R. L., 173
 Wang, E., 37, 38
 Wang, F. K., 109
 Wang, J. L., 26, 37
 Wang, R. T., 359
 Wang, W., 115
 Warburton, M. P., 271, 273, 274
 Ward, G. M., 526
 Wardell, W. L., 249
 Warden, J. T., 56
 Wardlaw, C. W., 240, 245, 252, 258, 489
 Wardlaw, I. F., 228, 297
 Warocquier, R., 27, 29
 Waterbury, J. B., 332
 Watson, L., 391
 Watt, G. D., 269
 Wear, J. I., 523, 541, 544
 Weare, N. M., 265, 266, 331, 333
 Weatherley, P. E., 123, 130
 Weaver, D. J., 521
 Weaver, P. F., 267
 Webb, M., 547
 Webb, W. W., 38
 Webber, J., 537
 Webster, T. R., 255
 Wehling, M. L., 513, 531, 533
 Weigl, J., 452
 Weihe, G. R., 463, 473
 Wehling, R. R., 496
 Weiland, J., 171, 176, 181
 Weinstein, J. D., 108, 113, 114
 Weintraub, H., 428
 Weisenberg, R. C., 38
 Weisenseel, M. H., 494
 Weiss, R. L., 196, 205
 Welch, L. F., 540, 543
 Welch, W. R., 385
 Wellburn, A. R., 103, 108, 183, 218
 Wellburn, F. A. M., 103, 218
 Wells, P. V., 383
 Wels, C. M., 154, 162, 175-77
 Welti, D., 323
 Wendt, I., 80, 81
 Wenkert, E., 157
 Went, F. W., 505
 Werkman, B. A., 476, 477
 Werkman, C. H., 69
 Werz, G., 498, 499
 Wessells, N. K., 496, 504
 Wessells, J. S. C., 353, 355
 West, C. A., 150, 155, 158-61, 171, 180, 183
 West, D. A., 545
 West, I. C., 450
 West, J., 48
 Westerfield, W. W., 109
 Westergaard, M., 435
 Westgate, P. J., 537
 Westoby, M., 280
 Wetherbee, R., 489, 492, 496
 Wetzel, R. G., 86
 Whalley, W. B., 157
 Wheeler, A., 226
 Whelan, T., 78-80, 82, 83, 390, 404
 Whitaker, D. M., 489, 490, 493, 494
 Whitby, L. M., 536
 White, A. F., 154, 157, 161, 162, 164, 165, 174, 175
 White, F. G., 48
 WHITE, M. C., 511-66, 541, 542, 544, 545
 White, R. E., 520
 White, R. P., 526
 White, R. S., 282, 284, 285, 293, 297, 306, 385
 White, S. K., 138
 Whiting, M. J., 100
 Whitman, P. J., 98
 Whittam, R., 443
 Whittenbury, R., 68, 69
 Whittingham, C. P., 76
 Wider de Xifra, E. A., 101, 114
 Wiebe, H. H., 385
 Wiechmann, A. H. C. A., 476
 Wiegiers, K. J., 37
 Wiehing, R. R., 495-97, 504
 Wiemken, A., 194-200, 202, 204-6
 Wiersma, D., 530
 Wilcox, M., 321-24, 333-36
 Wild, H., 536
 Wilder, G. J., 240
 Wildes, R. A., 448
 Wildman, S. G., 217, 220, 226
 Wildner, G. F., 232
 Wildung, R. E., 535
 Wilkens, M. B., 143
 Wilkins, M. B., 397
 Wilkinson, H. F., 514, 538
 Wilkinson, M. J., 398
 Willemse, M. T. W., 504
 Williams, C. H., 537
 Williams, D. E., 521, 526, 529
 Williams, E. J., 449
 Williams, M. W., 465
 Williams, R. B., 78
 Williams, R. F., 240, 241
 Williams, S., 254, 382
 Williams, S. L., 398
 Williams, St. E., 136
 Williams, W. A., 228, 278, 295, 297, 299, 301, 306, 308
 Williams, W. T., 256
 Wilson, A. M., 290, 301
 Wilson, C. M., 465, 468, 471
 Wilson, D., 230, 233
 Wilson, D. O., 524
 Wilson, E., 501-3
 Wilson, E. O., 462, 467, 470
 Wilson, G. L., 293, 297
 Wilson, P. W., 264, 267, 268
 Wilson, T. H., 445
 Wiltshire, G. H., 515
 Wimber, D. E., 433
 Windle, P., 544
 Winicov, I., 29
 Winklenbach, F., 323, 328
 Winskill, N., 476
 Winstanley, D. J., 476
 Winter, H. C., 266, 268, 269
 Winter, J., 389
 Winter, K., 383, 386, 398, 405
 Winter, R., 109
 Winterhalder, E. K., 527
 Wireman, J. W., 31
 Wiskich, J. T., 438, 453
 Witt, H. T., 56
 Wittenberg, B. A., 272
 Wittenberg, J. B., 272
 Wochok, Z. S., 255, 256
 Woermann, D., 136
 Wojciuch, E., 321, 322, 331
 Wolde-Yohannis, K., 296, 301
 Wolf, G., 225
 Wolf, H. C., 58
 Wolf, J., 380
 Wolfe, D. A., 78
 Wolff, C., 56
 Wolk, C. P., 321-36
 Wollgiehn, R., 220, 224, 225
 Wong, S. C., 382
 Wong, W., 70, 73, 82
 Wong, W. W. L., 77, 79, 82
 Woo, K. C., 102, 381, 391, 403
 Wood, N. B., 325, 326, 335, 336
 Wood, W. A., 101
 Woodcock, C. L. F., 217
 Woodcock, E., 26
 Woodward, R. G., 291-93
 Woolhouse, H. W., 519, 545-47
 Worcel, A., 428
 Wraight, C. A., 48, 61
 Wright, B. J., 452
 Wu, L., 546, 547
 Wurtz, T., 477
 Wyn Jones, R. G., 132, 133

Y

- Yafin, Y., 155, 180
 Yagi, H., 158
 Yahara, I., 26, 37, 38
 Yakubova, M. M., 223
 Yakulis, R., 111
 Yamagata, N., 536
 Yamagata, S., 547
 Yamaguchi, I., 182
 Yamamoto, K. R., 474, 479
 Yamane, H., 171-73, 181, 182
 Yamashita, T., 349
 Yamazaki, S., 182
 Yates, I., 463, 478
 Yates, M. G., 267, 268, 333, 544
 Yee, G. L. N., 513, 531, 533
 Yeo, A. R., 133

- Yeoman, M. M., 247
 Yokota, T., 171, 173, 181, 182
 Yoneda, Y., 524
 Yoshida, K., 526
 Yoshida, M., 439, 441
 Yoshida, S., 228, 531, 533
 Young, A. M., 327
 Young, J. L., 301, 302

Z

- Zak, J. M., 522
 Zalensky, O. V., 232
 Zalta, J. P., 27-29
 Zaman, Z., 99
 Zankel, K. L., 48, 49, 54-57
 Zechel, K., 29
 Zeevaart, J. A. D., 174, 181, 248, 249
 Zeiger, E., 246
 Zeikus, J. G., 32
 Zelitch, I., 69, 85, 232, 233
 Zetsche, K., 498, 499
 Zeuthen, E., 26
 Zickler, D., 433
 Ziegler, H., 406, 544
 Ziegler, I., 544
 Ziemann, J. C., 85
 Zillig, W., 29
 Zimmermann, R. L., 142
 ZIMMERMANN, U., 121-48;
 122-25, 127-31, 134-42
 Zirenki, G. K., 517
 Zolotukhin, T. E., 517
 Zumft, W. G., 267-69
 Zurier, R. B., 496
 Zwaal, R. F. A., 141
 Zyabkina, S. M., 517

SUBJECT INDEX

- A
- Abscisic acid, 287
ethylene production stimulation, 16
fruit ripening, 10
roles, 11
- Abscisin, 7
- Acacia
see Mulga
- Acacia harponophylla
leaf production time, 299
- Acetabularia
cliftonii
chloroplast ribosomal proteins, 220
mediterranea, 220
- Acetabularia spp.
action potentials, 142
cap regeneration, 498
electric current, 504
phosphorylase, 498-99
site, 494, 498
chloride transport, 452
electrogenic pumps, 444
- Acetate
assimilation
blue-green algae, 74-75
Chlamydomonas, 76
Chlorella, 76
Chromatium growth, 69-70
incorporation, 71
photoassimilation, 72
- Acetylene, 328
reduction by cyanobacteria, 331
- n-Acetylglucosamine, 478
- Achlya
ambisexualis
antheridiol, 473
oogoniol, 473
bisexualis
antheridiol, 473
oogoniol, 473
- Achlya spp.
genetic analysis, 474
- pheromones, 473-74
steroid hormones origin, 481
- Acid phosphatase, 519-20, 547
localization, 207-8
- Actin, 503
filaments, 496, 504
macromolecule transport, 504
plasma membrane, 496
- Actinomycin D, 474
- Adenosine monophosphate, 332
cAMP, 479
- Adenosine triphosphatase, 447, 450
aluminum inhibition, 519
anion, 452-53
plasma membrane vesicles, 442
potassium, 448-49
activation, 448, 450
proton pump, 439
kinetic control, 442
sodium transport, 439
vacuolar membrane, 199
citrate transport, 202-3
- Adenosine triphosphate
cation transport, 448
chloride influx, 451
citrate transport increase, 202
dependent H_2 evolution, 267-68
electrogenic pump, 442-43
Acetabularia, 444
hydrogen efflux, 438
membrane potential, 442-43
nitrogen
fixation, 269
reduction, 268
photosynthesis, 347
production
m-chlorophenyl hydrazone, 448
- sugar uptake, 447
see also Heterocysts
- S-Adenosyl-homocysteine, 200
- S-Adenosylmethionine, 197
specific transport, 200-1
- Aerobacter aerogenes
rRNA degradation, 29
- Agave
americana
water use efficiency, 294
deserti
carbon dioxide fixation, 384
leaf resistance to water loss, 385
seed production, 301
- Agrostis tenuis
aluminum tolerance, 519
- Alanine, 79, 109, 332
- Alanine dehydrogenase
Anabaena, 333
- Alfalfa (Medicago)
aluminum tolerance, 520
genetic control, 523
molybdenum effect, 521
iron tolerance, 534
manganese toxicity, 525-26
effect on nodulation, 530
genetic control, 531
soil water availability, 286
- Algae
see Pheromones in algae and fungi
- Alkaline phosphatase
vacuole, 206
- Allium
see Onion
- Allomyces
arbuscula, 465
response to sirenin, 466
macrogyne, 465
response to sirenin, 466
- Allomyces spp.
carotene, 475

- genetic study suitability, 467-68
- membrane isolation, 467
- sirenin, 465
- bioassay, 465
- effect on swimming behavior, 467
- formation, 466
- structure, 466
- zoospore chemotaxis, 467
- Allophycocyanin, 366-67
- Allophycocyanin B
- energy collection, 367
- spectral properties, 366
- Aloe arborescens*
- malic acid decarboxification, 395
- Aluminum, 533
- beneficial effect, 522
- differential tolerance, 514
- ammonium vs nitrate nutrition, 515
- calcium nutrition, 517
- organic complexes, 520
- pH changes in root zone, 514-15
- phosphorus nutrition, 517-20
- uptake and translocation, 516-17
- uptake of minerals, 521-22
- genetic control of tolerance, 522-23
- manganese-induced iron deficiency reversal, 527
- polyphenol complexes, 520
- redox potential, 518
- root accumulation, 518
- silicon effect, 529
- tolerance, 534
- toxicity, 532
- iron interaction, 521
- pH, 512
- physiological effects, 514
- symptoms, 513
- temperature, 512
- Alyxia rubricaulis*
- manganese, 529
- Amaryllis*
- actin, 504
- Aminoacylation, 32
- Aminoacyl-tRNA synthetase
- chloroplasts, 217
- coded for by nuclear genome, 221
- hydrostatic pressure effect, 35
- thermolability, 31
- α -Amino- β -ketoadipic acid, 98
- δ -Aminolevulinic acid and plastids
- chlorophyll pathway
- enzyme synthesis site, 115
- regulation, 110-11
- conclusion, 115
- formation in bacteria and animals
- δ -aminolevulinic acid synthetase reaction mechanism, 99
- synthetase occurrence, 100
- synthetase properties, 100
- formation in plants, 112-13
- alternate pathways, 103-4, 108-10
- carbon incorporation specificity, 106-7
- detection, 100
- intact greening tissues, 105-6
- levulinic acid, 104-5
- unsuccessful detection, 101
- formation regulation, 110-11
- enzyme formation sites, 114-15
- heme inhibition, 113
- light, 112
- multiple pathways, 114
- introduction, 96
- in vitro formation, 108-9
- porphyrin/chlorophyll formation, 107-8, 112
- in vitro, 108-10
- reports of synthetase in plant extracts
- colorimetric assay, 101-2
- radioisotope incorporation, 102-3
- unity in tetrapyrrole biosynthesis, 96
- the key precursor, 98
- pathway outline, 98
- primary products, 96
- protoporphyrin IX structure, 97
- δ -Aminolevulinic acid dehydratase, 104
- in chloroplasts, 114
- inhibitor, 112
- δ -Aminolevulinic acid synthetase, 105, 108
- detection, 100-1
- formation
- heme repression, 113
- inactivation, 113
- in dark, 114
- in plant extracts, 101
- colorimetric assay, 101-2
- mitochondria, 114
- occurrence, 100
- properties, 100
- reaction mechanism, 99
- δ -Aminolevulinic acid transaminase, 109
- Aminopeptidase, 206
- 4-Amino-3, 5, 6-trichloropicolinic acid, 8
- Ammonia, 264
- delayed fluorescence, 55-56
- water oxidation, 55-56
- see also Heterocysts; Nitrogen fixation
- Ammonium, 328
- nutrition
- aluminum toxicity, 515
- toxicity, 515
- Amylase, 393-94
- Anabaena
- catenula
- heterocyst study, 321
- proheterocysts, 335
- cylindrica
- ammonia assimilation, 265
- heterocyst coat, 323
- heterocyst differentiation, 335
- heterocyst study, 321
- mutant study, 336
- nitrogenase purification, 331
- nucleotide measurement, 337
- pyruvate decarboxylation, 328
- varabilis, 75
- mutant study, 322, 335-36
- photoautotrophy, 74
- pyruvate decarboxylation, 328
- strain 7118, 322
- Anabaena spp.
- alanine dehydrogenase, 333
- heterocyst differentiation, 333
- symbionts, 337-38
- Anabaena 7120, 322
- heterocyst-specific protein synthesis, 335-36
- nitrogenase components, 331
- Anacystis nidulans
- oxidative pentose phosphate pathway, 75
- photoautotrophy, 74
- Ananas
- see Pineapple

590 SUBJECT INDEX

- Ancymidol, 160
 Androspore, 472
 Angiosperms
 submerged
 photoautotrophy, 78-87
 Anthridiol
 activity, 473
 effects, 473
 protein synthesis, 473-74
 mode of action, 474
 Antirrhinum majus en:viridis
 photosystem II genetic defect, 223
 Apium
 see Celery
 Apple (Malus)
 calcium uptake
 aluminum interference, 517
 flowering and ethylene, 7
 manganese toxicity, 526
 nitrate reductase, 515
 Appleman, D., 14
 Apple rosette, 3
 Apple scald, 13
 Apricot (Prunus)
 soil water and yield, 301
 water use efficiency, 294
 Arabidopsis thaliana
 chlorophyll biosynthesis
 genetic control, 223
 genes in biogenesis plastid
 pigments, 218
 Arachis
 see Peanut
 Arginine, 74
 heterocyst plugs, 324
 localization
 Neurospora, 196
 Saccharomyces, 197
 significance, 205
 vacuolar
 pool, 202
 transport, 201-3
 Arginine-specific permease
 proteinase effect, 200
 tonoplast, 199-200
 catabolite repression, 201
 Arrhenius activation energies, 13
 Artemisia tridentata, 284
 phenology, 299
 soil water storage, 285
 Ascites tumor cells
 protein synthesis inhibition, 37
 ribonucleoprotein structure
 disintegration, 27
 RNA processing, 29
 rRNA synthesis impairment, 28
 Ascobolus stercorarius
 pheromones, 480-81
 Ascomycetes
 pheromones, 480-81
 Aspartate, 230, 271, 329-30, 332, 401
 β -carboxylation, 77
 synthesis, 69-70
 Anacystis, 74, 77
 Astragalus
 see Milk vetch, 522
 Athiorhodaceae, 68
 Atriplex
 canescens
 water use efficiency, 296
 confertifolia, 284
 water use efficiency, 297
 Atriplex spp.
 C₃ x C₄ crosses, 231
 Aucanten, 469, 471
 Auxin, 18
 ethylene action restraint, 9
 flower buds, 7
 fruit ripening, 10
 fruit set, 8-9
 roles, 11
 undetermined meristems, 254-56
 Avena
 see Oat
 Avicennia
 see Mangrove
 Avocado (Persea)
 ripening, 20
 Hill reaction, 21
 inhibitor, 18-19
 Azaserine, 329
 7-Azatriptophan, 334
 Azide, 199
 Azolla spp.
 Anabaena symbiont, 337
 Azotobacter
 chroococcum
 in vivo energy requirement, 268
 vinelandii
 nitrogenase production regulation, 265
 Azotobacter sp., 332
 B
 Bacillus
 megaterium
 iron-aluminum interaction, 521
 stearothermophilus
 ribosomal subunit heat stability, 31
 subtilis
 DNA synthesis, 26
 temperature and RNA synthesis, 27
 Bacteriochlorophyll
 oxygen effect on synthesis, 113
 Bacteriochlorophyll b, 48-49
 Bacteriopheophytin, 52
 Bacteroids, 271
 nitrogen fixation concept, 271-74
 similarity to mitochondria, 271
 Banana (Musa)
 copper toxicity, 537
 iron tolerance, 534
 Barley (Hordeum)
 aluminum tolerance, 514
 calcium, 517
 genetic control, 523
 iron interaction, 521
 manganese effect, 525
 phosphorus interaction, 518-19
 δ -aminolevulinic acid formation, 106, 112, 114
 carbon incorporation specificity, 106-7
 γ - δ -dioxovaleric acid transaminase, 109
 chlorophyll
 label, 114
 mutants, 115, 222
 chloroplast development
 nuclear genes, 223
 harvest index, 304
 heme
 formation, 114
 turnover, 113
 sodium efflux, 450
 water stress
 seed filling, 304
 tiller mortality, 302
 Barrel cactus (Ferocactus)
 response to rain, 288
 root system and soil water, 286
 Bean (Phaseolus)
 aluminum tolerance, 534
 cadmium toxicity symptoms, 542
 chlorosis
 metal interactions, 542
 gibberellin
 glucosyl esters, 173, 181-82
 2 β -hydroxylation, 168, 181

- pathways from aldehyde, 171-73
- iron-induced manganese deficiency, 534
- iron toxicity, 532
- tolerance, 534
- manganese toxicity
- effect on nodulation, 530
 - injury type, 528
 - internal levels, 526
 - iron ratio, 527
- metal chelate uptake, 539
- photosynthesis
- energy coupling, 372
 - energy distribution wavelength dependence, 362-64
 - PS I, PS II, Chl LH emission spectra, 364-65
 - PS I absorption band, 359
 - PS II to PS I energy transfer chloroplasts, 361
 - flushed leaves, 361-62
- Beet (Beta)
- betaine exclusion from vacuole, 133
 - chloride transport, 451
 - tonoplast
 - glucose specific hexokinase, 199
 - sucrose synthetase, 199, 204
- vacuoles
- ATPase absence, 199
 - sugar localization, 197
- Benzyladenine, 7
- Benzylaminopurine, 251
- Berberine, 206
- localization, 197
- Beta
- see Beet; Sugar beet
- Betacyanin
- vacuole isolation, 197
- Betaine
- exclusion from vacuole, 133
- Bicarbonate
- uptake, 452-53
 - utilization
 - photosynthesis, 84, 86
- Blakeslea trispora
- trispore precursors, 476
- Bouteloua gracilis
- respiration, 306
 - root types, 301
- Boyle-Van't Hoff law, 127
- Brassica
- see Mustard
- Brassica oleracea
- gibberellin and chloroplasts, 183
- Broad bean (Vicia)
- photosystem I
 - genetic defect, 223
- Brown algae
- pheromones, 468-70
 - biosynthetic pathway, 470
 - evolution, 470
 - mechanism of action, 470
- Bryophyllum
- calycinum
 - deacidification, 395 - diagramontianum
 - gibberellins, 174
 - 2 β -hydroxylation, 181
 - malic acid localization, 197, 205 - fedtschenkoii
 - crassulacean acid metabolism, 388 - tubiflorum
 - carbohydrate metabolism in dark, 393
- Bryophyta, 84
- Burg, S., 18
- C
- C₃ plants, 388, 404
- fossils, 382-83
 - glucan synthesis, 394
 - PEP carboxylase activity, 231
 - photorespiration, 233
 - photosynthesis similarity to CAM, 391
 - vs C₄ plants, 230
 - water use efficiency, 293
 - see also Plant productivity
- C₄ plants, 404
- chloroplast types, 230
 - explanation, 231
 - crassulacean acid metabolism, 381, 388-89
 - phosphoenolpyruvate carboxylase, 391
 - phosphoenolpyruvate export to cytoplasm, 394
 - photosynthetic capacity, 230
 - warm habitat, 293
 - see also Plant productivity
- C-550, 361
- Cadmium
- chelate
 - translocation, 540
 - uptake, 539, 544 - ecotype tolerance, 545
 - interaction
 - metals, 544
 - ozone, 542 - labile pool, 538
- soil equilibria, 537-38
- toxicity
- iron interaction, 541
 - phosphorus fertilizers, 537
 - source, 536
 - studies, 544
 - symptoms, 542
- Calcium, 38, 534
- aluminum
- beneficial effect, 522
 - toxicity effect, 513
- electrogenic pumps, 440
- flagellar activity alteration, 482
- manganese toxicity decrease, 529
- nutrition
- aluminum toxicity, 517
- protease, 325
- rhizoid formation, 490, 497
- transcellular current, 494-95, 505
- California Fruit Growers Association, 17
- Calothrix spp., 322
- Calvin cycle, 88, 230, 232, 330
- absence from heterocysts, 328
 - autotrophic CO₂ fixation, 69
- Chlorella, 76-77
- Chlorobium, 72-73
- Chromatium, 69
- Cyclotella, 77
- glucose synthesis, 83
 - higher plants, 78
- Rhodospirillum, 70
- repression, 71
- ribulose biphosphate carboxylase
- DNA code, 226
- Skeletonema, 77
- Camissonia claviformis, 293
- Canavanine, 199, 334
- Candida
- gelida
 - protein synthesis heat lability, 31
 - RNA synthesis, 27
- utilis
- amino acid storage pool, 204
 - arginine transport, 199-200
 - plasmalemma permeability induction, 196
 - turgor regulation, 205
- Cannabis

- see Hemp
- Capsicum
see Pepper
- Carbon dioxide, 231
- C₃ vs C₄ plants
photosynthetic capacity,
230
- chloroplast ultrastructure
alteration, 228
- concentration in bundle-
sheath cells, 230
- crassulacean acid metabo-
lism, 389-92
- day temperature, 387-88
- night temperature, 387
- phase I, 383
- fixation
rate and nitrogen fixation,
273
- response to environment,
405
- fruit
oxygen uptake stimulation,
19
- production stimulation by
ethylene, 17
- incorporation failure
heterocysts, 328
- photorespiration measure-
ment, 233
- release during photorespira-
tion, 232
- water use efficiency, 290
- single leaf, 290-91, 293-
94
- see also Crassulacean acid
metabolism; Obligate
photoautotrophy nature;
Plant productivity
- Carbonic anhydrase, 76
- Carbon isotope fractionation
model, 80-81
- Carbon monoxide
cell membrane resistance,
445
- Carbonyl cyanide, 445
- Carboxydismutase, 209
- β -Carboxylation, 69-70, 88
in algae, 76-77
- Chlorella, 76
- importance in photosynthe-
sis, 77
- C₄ plants, 78
- Carboxyomes
absence from heterocysts,
328
- β -Carotene, 475
- chemoreception, 476
- pheromones, 476-77
- Carrot (*Daucus*)
chloride transport, 451
- manganese toxicity
internal levels, 526
- Casbene, 158
- Castorbean (*Ricinus*)
organic manganese complex,
530
- Catabolite inactivation, 209
- Celery (*Apium*)
manganese toxicity, 528
- Cell polarity development,
487-510
- conclusions, 505-6
- Fucus development, 489-90
- embryo study advantage,
489-90
- rhizoid, 489-90
- introduction, 487-89
- definition, 487
- historical, 488
- polar protoplasmic struc-
ture, 488
- polar cell formation, 490
- Acetabularia cap regenera-
tion, 497-99
- contractile transport mech-
anism, 504
- cortical clearing, 493-94
- electrophoretic transport
mechanisms, 504-5
- event sequence, 495
- Fucus rhizoid formation,
501-3
- hypothesis, 495-97
- light effect, 491
- polar axis fixation, 490-
97
- polarity expression, 497-
98
- sulfated fucan deposition,
492
- transcellular current, 494
- transport mechanism, 503
- yeast septum formation,
499-500
- Cellulase, 546
- Cellulose
microfibril orientation,
246
- Centaurea spp.
gibberellin effect, 250
- Centrosema pubescens
manganese toxicity, 526
- Ceratoides lanata
water use efficiency, 297
- Ceratophyllum demersum
bicarbonate utilization, 86
- CO₂ compensation point, 86
- photosynthesis saturation,
86
- photosynthetic rates, 85
- Chaetomorpha linum
osmotically active molecules
regulation, 131
- turgor pressure, 128
- control, 141-42
- Chandler, W. H., 3, 5-6, 15
- Chara
annuum
stress-hardening effect,
130
- volumetric elastic modulus
values, 130
- corallina
action potential, 136, 141
- bicarbonate uptake, 452
- electrogenic pumps, 443
- membrane potential depo-
larization, 135-36
- turgor pressure measure-
ment, 124
- fragilis
volumetric elastic modulus
values, 129-30
- intermedia
volumetric elastic modulus
values, 130
- salina
osmotic balance adjustment,
132
- Chara spp., 504
- localization
acid phosphatase, 208
- carboxypeptidase, 208
- microfilaments, 495-96
- volumetric elastic modulus,
129
- Chelerythrine
detoxification, 206
- localization, 197
- Chelidonium majus
alkaloid localization, 197
- vacuoles as alkaloid detoxifi-
ers, 206
- Chiasmata
formation failure, 420
- see also Meiotic crossing-
over regulatory mecha-
nisms
- Chickpea (*Cicer*)
manganese toxicity types,
528
- Chilling injuries
membrane structure, 13
- Chinese hamster kidney cells
RNA synthesis, 27-29
- Chitin
localized synthesis
mechanisms, 500
- yeast cell wall, 499-500

- Chitin synthetase, 208, 500
 activity control, 500
 Chlamydomonas
 dysosmos
 obligate photoautotrophy, 75-76
 eugametos
 gamete attraction, 464
 moewusii
 gamete attraction, 464
 moewusii var. rotunda
 sexual attractant pheromone, 464-65
 reinhardtii
 chlorophyll mutants, 115
 chlorophyll synthesis inhibition, 113
 chloroplast biogenesis genetic control, 219
 chloroplast ribosomal proteins, 220
 gamete attraction lack, 464
 plastid protein synthesis and chromosomal DNA, 225
 protein synthesis requirement, 224
 stellata
 acetate photoassimilation, 76
 Chlamydomonas spp., 479
 Chloramphenicol, 115, 224
 inhibition
 chlorophyll synthesis, 225
 photosystem protein, 226
 Chlorella
 fusa, 112
 δ -aminolevulinic acid synthetase pathway, 106
 protothecoides
 protochlorophyllide, 111
 pyrenoidosa
 acetate assimilation, 76
 β -carboxylation, 76
 cell membrane breakdown, 141
 delayed light emission, 47, 55
 osmotic balance adjustment, 132
 vulgaris, 112
 Chlorella spp.
 δ -aminolevulinic acid accumulation, 105
 δ -aminolevulinic acid transaminase, 109
 copper exclusion, 547
 delayed fluorescence
 delay kinetics, 56-57
 intensity, 54
 red vs blue light effect, 58
 thermoluminescence, 59
 γ - δ -dioxovaleric acid, 103
 γ - δ -dioxovaleric transaminase, 109
 heme/chlorophyll synthesis, 96, 102
 photosynthesis quantum yield, 359
 photosynthetically active mutants, 232
 proton
 influx upon sugar addition, 446
 motive force, 447
 Chloride
 flux, 140
 control, 134
 indoleacetic acid, 135
 membrane conductivity, 134
 osmotically active molecules
 regulation, 131
 transport, 450-53
 Chlorobacteriaceae
 obligate photoautotrophy, 68
 Chlorobium
 limicola
 delayed fluorescence, 49
 obligate photoautotrophy, 72
 thiosulfatophilum, 87
 Calvin cycle enzymes, 72
 glutamic acid synthesis, 72
 reductive carboxylic cycle, 72-73
 ribulose biphosphate carboxylase, 72-73
 2-Chloroethaneophosphonic acid
 see Ethrel
 p-Chlorophenoxyisobutyric acid, 9
 m-Chlorophenyl hydrazine, 445, 449
 chloride uptake, 451
 potassium uptake, 448
 Chlorophyll
 biosynthesis
 genetic regulation scheme, 222
 mutant, 222
 see also δ -Aminolevulinic acid and plastids; Delayed fluorescence in photosynthesis
 Chlorophyll a, 326
 fluorescence, 48-49
 low temperature effect, 60
 Chlorophyll a/b complex, 347-48, 365
 flashed bean leaves, 362, 373-74
 photochemical apparatus model, 353, 355
 Chlorophyll b, 359-60, 374
 during leaf greening, 362
 Chlorophyll C-705, 353, 355
 Chlorophyllide a, 110
 Chloroplasts
 C₃ glucan synthesis, 394
 carboxydismutase loss, 209
 dihydroxyacetone phosphate export, 402
 distribution
 Thalassia, 78-79
 DNA, 217
 configuration, 219
 genome sizes, 217-18
 function
 genotypic determination, 230
 genetic regulation scheme, 224
 genophore
 gene content, 220
 mapping, 219-20
 mitochondria effect, 225
 nuclear mRNA translation, 225
 nucleus role in biogenesis, 218, 221
 numbers and gene dosage, 224-25
 phosphoenolpyruvate carboxylase, 391
 pigment aggregates, 223
 protein synthesizing system, 217
 ribulose biphosphate carboxylase, 226, 231, 391
 structure
 alteration by CO₂, 228
 C₄ plants, 230
 genotypic determination, 230
 terpene synthesis, 183
 see also Photosynthesis apparatus energy distribution; Photosynthesis genetics and crop improvement
 Chloropseudomonas ethylicum
 ribulose biphosphate carbox-

- ylase, 72
TCA cycle lack, 72
Cholesterol, 37, 174
Chromatium
 okennii, 69
 vinosum
 photoautotrophy, 69
Chromatium spp.
 citramalate pathway, 71
 growth on acetate
 carbon metabolism changes,
 69-70
 reductive pentose phosphate
 cycle, 82
Chromium translocation, 541
Chromosome
 repair of breaks, 422
 see also Meiotic crossing-
 over regulatory mecha-
 nisms
Chrysanthemum
 phyllotaxis alteration, 242
Chymotrypsin, 141
Chymotrysinogen, 141
Cicer
 see Chickpea
Circadian rhythm
 crassulacean acid metabolism
 plants, 397
 regulation, 403
Citramalate pathway, 71-72
Citramalate synthase, 72
Citrate, 330
 iron binding in xylem, 539
Citrate lyase, 72-73
Citrate synthetase, 76
Citric acid, 108, 520
 vacuole
 localization, 197, 201
 transport, 202
Citrulline, 76
Citrus
 aluminum benefit, 522
 copper-induced chlorosis,
 542
 iron deficiency, 513
 see also Lemon
Citrus mottle leaf, 3
Cladophora spp., 498
 polarity, 488
Clivia spp.
 microfilament, 504
Clostridium sp.
 nitrogenase, 331
Clover (Trifolium)
 manganese tolerance, 525
Cobalt
 chelates
 uptake, 539
 in xylem, 540
Codium decorticateum
 chloride flux, 134
 osmotically active molecules
 regulation, 131
 turgor pressure, 128
Coffee
 phenology, 299
Colchicine, 246, 421, 433,
 492
 lectin receptor redistribu-
 tion, 496
Coleus
 leaf primordia initiation,
 246
Colicins, 36
Concanavalin A, 500
 membrane receptors redis-
 tribution, 495-96
 yeast vacuole binding, 198
Convolvulus
 advantitious organ formation,
 256
Copalylpyrophosphate, 157
ent-kaurene formation, 158
Copper
 chelate
 uptake, 539
 xylem copper, 540
 ecotype tolerance, 545-46
 mechanism, 546
 labile pool, 538
 soil equilibria, 537-38
 sulfur interaction, 542
 toxicity, 536, 542
 iron interaction, 541
 metals interaction, 542
 source, 537
 study, 544
 translocation, 540
Cordylone terminalis
 shoot-rhizome dimorphism,
 257
Corn (Zea), 112
 aluminum tolerance, 514
 beneficial effect, 522
 magnesium effect, 521
 phosphorus nutrition, 517-
 18
 root phosphatase, 519
 δ -aminolevulinic acid form-
 ation, 106-7, 109
 δ -aminolevulinic acid trans-
 aminase, 109
CO₂ compensation points,
 86
copper uptake, 539
foliar lead, 540
gibberellin
 2- β -hydroxylation, 174
 isokaurene formation, 158
ent-kaurene synthesis, 180
iron/aluminum effect on root
 rot, 521
iron tolerance, 534
lead localization, 543
manganese tolerance, 525
metal toxicities, 542
phytochrome involvement in
 greening, 113
turgor pressure measure-
 ment, 125
zinc uptake, 539
Corrinoids, 96, 98
Cotton (Gossypium), 83
 aluminum toxicity, 512
 injury sites, 518
 manganese toxicity, 524,
 527
 iron relationship, 527
 phenology, 298
 photosystem I genetic defect,
 223
 photosynthetically positive
 mutants, 232
 soil water
 root zone storage, 285
 stomatal closing, 289
 theoretical yield, 228
 zinc toxicity, 537
Coulter counter
 cell volume measurements,
 128, 139
Cowpea (Vigna)
 phenology, 298
Crane, J. C., 8
Crassulacean acid metabolism
 (CAM), 205, 307, 379-414
 aridoactive plants, 281
 carbon isotope ratios as in-
 tegrators, 404
 CO₂ fixation response to
 environment, 405-6
 regulated metabolism in-
 tegration, 404-5
 conclusions, 406-7
 definition, 380-82
 CO₂ assimilation phases,
 380-82
 double carboxylation hypothe-
 sis, 389-90
 environmental context, 383
 CAM induction and water
 relations, 386
 day temperature and light
 intensity, 387
 endogenous and develop-
 mental factors, 388-89
 night temperature, 387
 other responses, 386-87
 photoperiod, 388

- stomatal responses, 385
 water relations, 383-85
 introduction, 380
 physiological context, 381
 carbohydrate metabolism
 in dark, 392-94
 compartmentation and trans-
 port, 395-97
 CO₂ fixation and malic acid
 synthesis, 389-92
 malic acid decarboxylation,
 392
 pyruvate and PEP fate, 394-
 95
 regulation, 397-98
 carbohydrate synthesis,
 402
 deacidification, 400-2
 during circadian rhythms,
 403
 during stress, 403-4
 by enzyme capacity change,
 398
 malic acid synthesis, 398-
 400
 phase 4 carboxylases, 402
 taxonomic and geographic
 context, 382-83
 arid regions, 383
 water utilization efficiency,
 294
 Creosote bush (*Larrea*)
 water use efficiency, 296
Crepis capillaris
 mutants, 422
 Crop improvement by cell cul-
 ture
 requirements, 12
 Crossover
 see Meiotic crossing-over
 regulatory mechanisms
 Cucumber (*Cucurbita*), 112
 δ -aminolevulinic acid forma-
 tion, 108
 δ -aminolevulinic acid forma-
 tion, 105
 protoporphyrin IX, 112
 formation, 114
Cucurbita pepo
 geranylgeranylpyrophosphate
 formation, 155
Cucurbita spp.
 gibberellin
 aldehyde synthesis, 160-
 62
 carbon-20 loss, 174
 metabolite identification,
 154
 pathways from aldehyde,
 166-68
 ent-kaurene to ent-7 α -
 hydroxykaurenoic acid
 sequence, 159
Cutleria spp.
 aucanten, 469
 ectocarpus, 469-70
 multifidene, 469
 Cyanide, 19
 Cyanidium caldarium, 112
 δ -aminolevulinic acid form-
 ation, 106-7, 109
 phycobillin synthesis, 111
 Cyanobacteria
 PS I, 366
 see also Heterocysts
 Cyanophage N1, 322
 Cyanophycin, 335
 heterocyst plugs, 324
 synthesis, 330
 Cyclic adenosine monophos-
 phate (cAMP), 479
 Cyclohexane-tetrol
 osmotic balance adjustment,
 132
 Cycloheximide, 28, 33, 115,
 447, 493, 524
 effect on cell polarity, 491-
 92, 495
 formation inhibition
 photosystem II proteins,
 226
 plastid proteins, 224
 Cyclothella nana
 Calvin cycle, 77
 Cymodocea rotundata
 photosynthesis stimulation,
 79
 Cysteine, 182
 Cytisus scoparius
 gibberellin glucosyl ethers,
 181
 Cytochalasin B, 492-93, 497
 effects on polar axis forma-
 tion, 491, 495, 506
 microfilament attachment
 prevention, 496
 sulfated fucan deposition,
 492
 Cytochrome b₅₅₉, 327
 Cytochrome b₅₆₃, 327
 Cytochrome c
 solute extraction from cells,
 195
 Cytochrome c₅₅₄, 327
 Cytochrome f-552, 223
 Cytochrome P₄₅₀, 159-60,
 168
 Cytokinin, 244, 287
 fruit set, 8-9
 organ formation, 256
 roles, 11
 Cytoseira spp.
 rhizoid formation site, 490
 Cytosol, 500
 D
 2,4-D (2,4-dichlorophenoxy-
 acetic acid), 7
 effect on membrane resis-
 tance to pressure, 135
 fruit maturation, 9
 Darlingtonia spp.
 shoot apex differentiation,
 250
 Daucus
 see Carrot
 Davis, A. R., 6
 Dehydration effect on protein
 synthesis, 35
 1,10-Dehydro-19,2-lactone,
 166
 Delayed fluorescence in photo-
 synthesis, 47-66
 discovery, 47
 factors affecting intensity,
 50
 flash number, 54-55
 origin, 51
 photosynthesis relationship,
 47
 pigments and systems, 48-
 49
 photosystem II, 48
 recombination hypothesis,
 48
 closed reaction centers,
 52-53
 excited reaction center pig-
 ment, 49
 primary charge pair, 50
 quantum yields, 52
 rate constant, exciton, and
 emission yields, 50-52
 red vs blue light, 58
 secondary electron transport
 in PS II, 53-54
 decay kinetics, 56-57
 low temperature emission,
 57-58
 S states, 54-56, 61
 thermoluminescence, 58-
 60
 stimulation
 acid, 60
 electrical field, 61
 organic solvents, 61
 salt, 61
 temperature, 61
 6-Deoxyglucose, 447

- Deoxyribonucleic acid
 accumulation inhibition, 27
 chloroplast, 217
 importance, 218
 mapping, 219-20
 photosystems I and II, 223
 protein synthesis and chromosomal DNA, 225
 replication inducer control, 224
 RNA hybridization, 220
 duplex, 431
 endonuclease, 419
 fragment insertion, 416
 heterocysts, 324, 336-37
 meiosis
 breakage regulation, 419-22
 breaks, 417
 nicking at pachytene, 417-19, 427
 pachytene fractions, 425-26
 prophase synthesis sites, 423-26
 reannealing, 429
 repair synthesis, 422-23, 427
 U-protein, 429, 435
 zygotene DNA synthesis, 424
 plastochron, 247
 replication
 aluminum effect, 519
 manganese effect, 524-25
 RNA polymerase complex, 29
 sedimentation behavior, 420
 synthesis
 heat effect, 26
 thermal injury repair, 26
 see also Meiotic crossing-over regulatory mechanisms
 Deoxyribonucleic acid polymerase, 419, 423, 427
 U-protein, 435
 competition, 429
Deschampsia flexuosa
 aluminum and nitrate tolerance, 515
 iron tolerance, 534
 Deuterium
 gibberellin metabolite identification, 154
 Dextrane sulfate, 37
 2,4-Dichlorophenoxyacetic acid
 see 2,4-D
 3,5-Dichlorophenoxyacetic acid, 135
 3-(3,4-Dichlorophenyl)-1,1-dimethylurea, 55-56, 59, 326, 333, 360, 362, 374, 449, 451
Dicksonia squarrosa
 leaf initiation, 247
Dictyoptera spp.
 ectocarpin, 469-70
Dictyuchus spp.
 pheromone, 475
 Dicyclohexyl-18-crown-6, 37
 Diethylstilbestrol, 445
 Dihydrocopsisine, 206
 localization, 197
 Dihydroxyacetone phosphate
 export from chloroplast, 402
 7 β -13-Dihydroxykaurenoide, 176
 Dimethyl-3-propiothetin, 197
 Dinitrophenol, 199, 201-2, 516
 γ - δ -Dioxovaleric acid, 109
 δ -aminolevulinic acid formation, 103, 109-10
 conversion to α -hydroxyglutarate, 109
 γ - δ -Dioxovaleric acid transaminase, 103
 δ -aminolevulinic acid formation, 108-9
 in plants, 109
 α , α -Dipyridyl, 113
 Douglas fir (*Pseudotsuga*)
 manganese toxicity, 527
Drosophila melanogaster
 RNA processing, 29
 RNA transcription
 heat effect, 28-29
Drosophila spp.
 crossing-over frequency, 426, 435
 Drought resistance
 see Plant productivity
Dryopteris dibtata
 primordia isolation effect, 252
Dunaliella parva
 glycerol synthesis, 133
 nonosmotic volume, 127
 osmoregulation, 127
Dunaliella spp.
 osmotic balance adjustment, 132
 E
Echeveria pumila
 growth and transpiration ratio, 386
Ectocarpus, 469
 essential oil, 470
 gamete binding, 470
 pheromone threshold concentration, 469
Ectocarpus siliculosus
 gamete attractant, 468
 gamete behavior, 468
 ectocarpin, 469
Ectocarpus spp.
 ectocarpin, 470
 genetic studies, 471
 life cycle, 471
 pheromone, 469
 receptors, 470
Egeria densa
 photosynthesis saturation, 86
Elodea
 canadensis
 CO₂ compensation point, 86
 CO₂ fixation, 87
 photosynthesis saturation, 86
 occidentalis
 photosynthesis rates, 85
Encelia farinosa
 water use efficiency, 292
 Endonuclease
 meiosis, 422, 430
 chromosome pairing, 421
 DNA nicking, 419
 transient formation, 421
 Endonuclease-restrictase, 220
 Endoplasmic reticulum
 microtubule association, 38
 polysome association, 35
 Energy coupling
 see Membrane transport energy coupling
 Enolase, 402
 Enzyme
 penetration and turgor pressure, 141
 2,3-Epoxyde, 172
 Equisetum spp., 497
Erica
 cinera, 534
 tetralix
 iron tolerance, 534
Escherichia coli, 30
 DNA synthesis, 26
 electrogenic pump regulation, 442
 β -galactoside permease
 proton-linked, 445

- gene expression, 320
initiating factor heat lability, 32
ribosomal subunit heat stability, 31
RNA degradation, 30
RNA polymerase, 29
rRNA degradation, 29
tRNA conformational changes, 32
translation
initiation cold sensitivity, 34
recovery, 34
Estrone, 174
Ethane
gamete attraction, 464
Ethionine, 334
Ethrel (2-chloroethaneophosphonic acid), 7
fruit growth, 9
Ethylene, 7, 19
fruit
CO₂ production rise, 17-18
growth, 8
maturation, 9-10
uridine incorporation, 20
gamete attraction, 464
roles, 11
synthesis, 18
Etioplasts, 217-18, 224
Eucalyptus
gummifera
manganese tolerance, 527
saligna, 527
Eucalyptus spp.
aluminum
beneficial effect, 522
manganese toxicity
iron treatment, 527
Euglena gracilis
chlorophyll synthesis, 111-12
chloroplast DNA importance, 218
lamellar protein code, 221
plastid development, 112
Euphorbia esula
procambial traces, 242-43
Exonuclease
DNA
nicking, 422
repair and recombination, 427
F
Farnesylpyrophosphate, 155
synthetase, 155
Fegatella spp., 497
Ferocactus
see Barrel cactus
Ferocactus acanthodes
CO₂ dark assimilation, 385
Ferredoxin
cyanobacteria, 327-28
Ferricyanide, 349
Fibonacci phyllotaxis, 240-41
Fischerella spp., 322
Flax (Linum)
aluminum beneficial effect, 522
iron toxicity, 532
Florigen
flowering role, 7
Flower bud differentiation, 7-8
18-Fluoro gibberellin-aldehyde
metabolism, 179
Fluorophenylalanine, 334
5-Fluorouracil, 477
Fontinalis antipyretica, 86
Formic acid, 72
Frankia spp., 271
Frenkel, C., 9
Fructose
Anabaena growth, 322
Fructose-1,6-diphosphate, 400
Fucoidin, 493
composition, 501
electric mobility, 505
Fucus rhizoid formation, 501-3
sulfate accumulation, 502
lectin binding, 502
Fucoserratin, 468
threshold concentration, 469
Fucus
distichus
fucoidin sulfation, 502
light and polar axis fixation, 491
polar axis fixation, 490
serratus
fucoserratin, 468
fucoserratin sensitivity, 469
spiralis
sexual pheromone, 468
vesiculosus
fucoidin, 493
fucoserratin sensitivity, 469
light and rhizoid formation, 491
osmophilic body accumulation, 492
rhizoid formation site, 493
sexual pheromone, 468
Fucus spp.
carotene, 475
development, 489
embryo study advantage, 490
rhizoid, 489
electric current, 504
gamete chemotaxis, 464, 468
polar cell formation, 490
polar axis fixation, 490-97
polar axis fixation hypothesis, 497, 504
polar plasmolysis, 494
polarity, 489
studies, 505-6
rhizoid formation, 501
fucoidin, 501
lectin binding, 503
sulfation, 502-3
Fumarase, 389
Fumarate reductase, 72
Fungi
see Pheromones in algae and fungi
Fusicoccin, 445
electrogenic hydrogen efflux, 440
potassium uptake, 448
G
Galactose, 498
lectin binding inhibition, 503
β-Galactoside permease
proton-linked, 445
Geranylgeranylpyrophosphate
ent-kaurene synthesis
inhibitors, 158
intermediate, 155
metabolic control, 180
steps, 155, 157-58
synthetase, 155
proplastids, 183
Geranylpyrophosphate, 155
Gibberella fujikuroi, 150
carbon-20 loss, 174
gibberellin-alcohol metabolism, 179
gibberellin-aldehyde formation, 161, 184
ent-7α-hydroxykaurenoic acid synthesis, 159
3β-hydroxylation, 157
ent-kaurene synthetase purification, 158
ent-kaurenoic acid ring D

598 SUBJECT INDEX

- analogs, 176-77
- metabolism of GA analogs and precursors, 175-76
- mutant B1-41a, 151, 162-66, 174, 176-77, 179
- pathways from GA-aldehyde, 162-66
- unnatural steviol effect, 169
- ent-Gibberellane, 150-51
 - structure, 154
- Gibberellic acid, 524
- Gibberellin
 - cactus spine production, 251
 - ethylene effect counteraction, 10
 - fruit set, 8
 - glucosyl ether, 171-73, 182-83
 - leaf form change, 250
 - phyllotactic change, 242
 - plant development role, 7
 - roles, 11
- Gibberellin metabolism, 149-92
 - cell-free pathways from GA-aldehyde, 166
 - Cucurbita, 166-68
 - Phaseolus, 168
 - Pisum, 168
 - cellular pathways from GA-aldehyde
 - natural process criteria, 168-69
 - other plants, 174
 - Phaseolus, 171-73
 - Picea, Pinus, Pseudotsuga, 173-74
 - Pisum, 169-71
 - C₂₀-GA conversion to C₁₉-GA mechanism, 174-75
 - compartmentalization, 182-83
 - conclusions, 184-85
 - questions, 184-85
 - enzymes nature, 168
 - fungal metabolism of GA
 - analogs and precursors, 175-76
 - C₂₀-GA analogs, 179
 - ent-kaurenoide ring A analogs, 177, 179
 - miscellaneous analogs of ent-kaurenoic acid, 177
 - fungal pathways from GA-aldehyde
 - Gibberella mutants, 162-63
 - 3-hydroxylation pathway, 163-65
 - non-3-hydroxylation path-
 - way, 165-66
 - gibberellin-aldehyde synthesis, 160-61, 164-65
 - intact higher plants, 162
 - ring contraction mechanism, 161-62
 - gibberellin levels regulation, 179-80
 - branch-points metabolic control, 180
 - gibberellin derivatives, 181-82
 - 2 β -hydroxylation, 181
 - glucosyl esters, 171-73, 181-82
 - ent-7 α -hydroxykaurenoic acid synthesis
 - enzymes properties, 159-60
 - mixed-function oxygenases, 159
 - pathway, 159
 - 2 β -hydroxylation, 169-70, 174, 180
 - 3 β -hydroxylation, 171-72, 174, 179
 - suppression, 177
 - introduction, 150-54
 - aldehyde, 151
 - gibberellin structures, 151-53
 - plant vs fungus pathways, 151
 - ent-kaurene formation from mevalonic acid, 155-58
 - metabolite identification, 154-55
 - Gibberethione, 182
 - Gleotrichia spp., 322
 - Glucokinase, 393-94
 - Glucose, 498, 524
 - blue-green algae assimilation, 75
 - dehydrogenase, 75
 - synthesis, 83
 - Glucose-6-phosphate, 400
 - dehydrogenase, 328, 393, 399
 - phosphoenolpyruvate carboxylase activation, 399
 - Glucosephosphate isomerase, 393
 - α -Glucosidase, 206
 - β -Glucosidase, 206
 - Glutamate, 264, 274, 333
 - ammonium assimilatory enzymes regulation, 271
 - heterocysts, 329-31
 - synthase, 264-65, 270-71, 273
 - ammonium assimilation, 274
 - Glutamic acid, 18, 199
 - absence from vacuoles yeast, 197
 - δ -aminolevulinic acid formation, 104-5, 108-9, 112
 - isotope distribution, 71
 - Chlorobium, 72
 - plant uptake, 108
 - protoheme formation, 107
 - protoporphyrin IX formation, 108, 114
 - synthesis, 71-73
 - blue-green algae, 74
 - Glutamine, 265, 330, 333
 - accumulation in vacuoles, 196
 - heterocysts, 329, 334
 - nif operon regulation, 332
 - synthetase, 264-65, 270, 273
 - ammonium assimilation, 274
 - Anabaena, 338
 - bacterial nitrogen fixation role, 332, 339
 - heterocysts, 329, 331
 - inhibitors, 332
 - Nif genes transcription, 266
 - Glutamine-oxoglutarate amido transferase
 - Anabaena, 332-33
 - heterocysts, 329, 331
 - Glyceraldehyde phosphate dehydrogenase, 401
 - Glycerol, 396
 - osmotic balance adjustment, 132
 - synthesis, 133
 - Glycine, 71, 79, 199, 332
 - δ -aminolevulinic acid formation, 98-102, 107, 114
 - Chlorella, 106
 - cucumber, 105
 - chlorophyll formation, 102-3
 - plant uptake, 108
 - protoheme formation, 107
 - vacuole accumulation, 201
 - see also Soybean
 - Glycine-betaine
 - osmoregulation, 132-33
 - Glycolate synthesis
 - C₄ plants, 78
 - Glycolate oxidase, 86
 - Glycolate pathway, 79
 - Glyoxylase, 109
 - Glyoxylate cycle, 76

- Golenkinia minutissima*
 protochlorophyllide, 111
- Golgi bodies
 rhizoids, 492
- Gonadotropic hormones, 479
- Gossypium
 see Cotton
- Gram (Phaseolus)
 δ -aminolevulinic acid formation, 107
- Grape (*Vitis*)
 tonoplast sugar transporting system, 204
- Griffithsia spp.
 polarity, 488
- Gunnera spp.
 Nostoc symbiont, 337-38
- H
- Haemanthus* spp.
 actin, 504
 microfilaments, 496
- Halicystis parvula*
 chloride flux, 134
 osmotically active molecules regulation, 131
 turgor pressure, 128-29
- Halophila ovata*
 photosynthesis reduction, 79
- Hatch and Slack pathway, 74, 78
 sugar synthesis, 83
- Heat effects on protein synthesis, 25-46
 conclusions, 38-39
 DNA synthesis, 26
 introduction, 25-26
 membrane involvement in regulation, 35-36
 cell surface effects, 36-37
 protein synthesis impairment, 30
 repair, 33-34
 ribosome thermostability, 30-33
 RNA synthesis, 27-30
 biological significance, 28
 degradation, 29-30
 translational response to stress
 microtubules, 38
 putative structural mechanisms, 37-38
 translational stages thermostability, 31-32
 aminoacyl-tRNA thermostability, 31
 translation initiation
- environmental stress
 sensitivity, 34-35
 inhibition and cell injury, 36
- Hedera helix*
 leaf form change, 250
- HeLa cells
 cell surface characteristics and heating, 36
 protein synthesis impairment, 30
 inhibition, 37
 regulation at elevated temperatures, 32
 translation recovery, 34
- RNA
 degradation, 30
 synthesis, 27-29, 33
- Helianthus*
 see Jerusalem artichoke;
 Sunflower
- Hematin imide, 108
- Hemes
 see δ -Aminolevulinic acid and plastids
- Hemin
 globin synthesis, 32
- Hemp (*Cannabis*)
 iron tolerance, 534
- n-Heptane, 468-69, 471
- Heterocysts
 biochemistry, 325-26
 carbon metabolism, 328-29
 carbon/nitrogen flow model, 330
 nitrogenase, 331
 nitrogen fixation requirements, 325
 nitrogen metabolism, 329-33
 photosynthetic activities, 326-27
 differentiation, 333-37
 gene transcription, 336-37
 proheterocysts, 334
 protein synthesis, 335-36
 experimental material choice, 321-22
 future direction, 338-39
 introduction and conclusions, 319-21
 definition, 319
 gene regulation, 320
 microplasmodesmata, 321
 protease, 321
 role, 320
 isolation, 324-25
 requirement for nitrogen
- fixation, 336
 structure, 323-24
 DNA, 324
 envelope, 323
 granules, 323-24
 plugs, 324
 septum, 323
 thylakoids, 324
 in symbiotic cyanobacteria, 337
- Heteromeles arbutifolia*
 water use efficiency, 294
- Hevea brasiliensis*
 amino acid localization, 201
 arginine/lysine transport, 201
 ATPase in vacuoles, 199
 citrate transport, 202-3
 inorganic ion distribution, 198
 malic/citric acids localization, 197, 201
 mRNA in luteoids, 198-99
 proton pump, 203
 tonoplast properties, 198
- Hexosamine, 499
- n-Hexane, 468
 pheromone
 threshold concentration, 469
- Hibbard, P. L., 3
- Hill reaction, 21, 223
- Hippeastrum
 ATPase in vacuoles, 199
- Histidine, 199-200
- Histone, 250, 428
- Hoagland, D. R., 3, 5-6
- Hodgson, R. W., 15
- Holochrome, 110
- Hordeum
 distichon
 diterpene formation, 162
 ent-7 α -hydroxykaurenic acid synthesis, 159
 vulgare
 gibberellins and chloroplasts, 183
 see also Barley
- Hormones
 definition, 462
- Horticulture-plant physiology
 interface, 1-23
 academic freedom, 22-23
 biology, 22
 chemical regulation, 6-7
 flower bud differentiation, 7-8
 fruit maturation, 9-10
 fruit set and growth control, 8-9

- state of the art, 10-11
 definition, 2
 emerging research frontiers
 basic processes control,
 11-12
 crop regeneration and im-
 provement, 12
 old problem-new approach,
 13
 fruit ripening-leaf senescence,
 19-21
 no better life, 23
 physiological disorders stud-
 ies
 important scientists, 5-6
 interdisciplinary approach,
 3-4
 the problem, 3
 take-home lessons, 4-5
 postharvest physiology
 ethylene, 18
 a fortunate break, 17-18
 unfinished research, 18-19
 subtropical horticulture, 21-
 22
 training for teaching and re-
 search
 Davis nondegree program,
 14-15
 horticulture-plant physi-
 ogy at Berkeley, 15-17
 immigrant in California,
 13-14
Hydrilla verticillata
 anatomy and $\delta^{13}\text{C}$ values,
 87
 CO_2 compensation point, 86
 photosynthesis saturation,
 86
 photosynthetic rates, 85
Hydrodictyon africanum
 chloride influx, 451
 sodium efflux/potassium
 influx, 449
 Hydrogen
 efflux, 438
 electrogenic pumps, 439-40,
 444
 electric potential, 440
 nitrogenase catalyzed evolu-
 tion, 267-68
 potassium transport, 448
 transport
 animals, 439
 bacteria, 438-39
 Neurospora, 442
 plant cells, 439
 uptake system, 272-73
 see also Membrane transport
 energy coupling
- Hydrogenase, 333
 Hydrogenomonas, 75
 Hydrostatic pressure
 protein synthesis inhibition,
 34-35
 Hydroxamate, 521
 β -Hydroxybutyrate, 71
 12 α -Hydroxygibberellin, 169-
 70
 α -Hydroxyglutarate, 109
 ent-7 α -Hydroxykaurenoic
 acid, 164, 177
 formation from ent-kaurene
 enzyme properties, 159-
 60
 Hordeum chloroplasts,
 183
 pathway, 159
 gibberellin-aldehyde synthe-
 sis, 160-61
 ent-15 α -Hydroxykaurenoic
 acid, 177
 ent-15 β -Hydroxykaurenoic
 acid, 177
 ent-3 α -Hydroxykaurenol, 179
 Hydroxylamine, 50, 53-54,
 57
 δ -Hydroxylevulinic acid, 109
 4-Hydroxymethyltrisporates,
 476
 Hypochoeris radicata
 bivalents at meiosis, 422
 Hypolepis punctata
 bud conversion, 254
- I
- IF-2 initiating factor
 heat lability, 32
 Indoleacetic acid, 244
 effect
 membrane resistance to
 pressure, 135
 fruit
 growth, 9
 maturation, 9
 manganese toxicity, 524
 meristem determination,
 255
 shoot-rhizome dimorphism,
 257
 Indoleacetic acid oxidase,
 524
 isozymes
 fruit ripening, 10
 Invertase, 206
 Ipomoea
 see Morning glory
 Iron
 citrate binding in xylem,
 539
- deficiency
 aluminum interaction, 521-
 22
 cause, 513, 545
 manganese cause, 527
 metals interaction, 544
 symptoms, 541
 gibberellin metabolism, 168
 manganese toxicity decrease,
 527-28
 other metals interaction,
 541
 toxicity
 differential tolerance, 534-
 35
 general occurrence and
 importance, 531
 manganese association, 527
 uptake, 539
 Isocitric lyase, 75
 Chlamydomonas, 76
 Isofluridosis
 osmotic balance adjustment,
 132
 synthesis, 133
 Isokaurene, 158
 Isopentenylpyrophosphate, 155
 Isopentenylpyrophosphate iso-
 merase
 proplastids, 183
 Isosteviol metabolism, 177
- J
- Jerusalem artichoke (*Helian-
 thus*)
 heating effect on nucleoli,
 27-28
 Jojoba (*Simmondsia*)
 water use efficiency, 293
- K
- Kalanchoë
 blossfeldiana
 CAM modulation by inhibi-
 tor, 388
 carbon dioxide fixation,
 406
 PEP carboxylase synthesis,
 398
 photoperiod effect on CAM,
 388
 daigremontiana
 malic acid synthesis regu-
 lation, 399-400
 metabolic interactions, 404-
 6
 NAD malic enzyme, 392

night temperature effect
on CAM, 387
ribulose-1, 5-bisphosphate
carboxylase, 391
tissue water potentials,
384
vacuole osmotic pressure,
397
ent-Kaurene, 150, 162, 167,
179-80
conversion to gibberellin-
aldehyde, 159-62, 168
conversion to ent-7 α -hydro-
xykaurenoic acid
pathway, 159
formation from mevalonic
acid, 155-58
structure, 154
synthesis in chloroplasts,
183
ent-Kaurene synthetase
metabolic regulation, 180
protoplasts, 183
purification, 158
ent-Kaurenoic acid, 163
chloroplasts, 183
metabolism, 177, 179
ring D analogs, 176-77
steviol metabolism, 176
ent-Kaurenol, 177, 183
 α -Ketoglutarate, 106-7, 274
 δ -aminolevulinic acid form-
ation, 108-10, 112, 114
 γ - δ -dioxovaleric acid form-
ation, 109
 α -Ketoglutarate dehydrogen-
ase, 69, 105
lack
Anacystis, 75
blue-green algae, 74, 87
Chlamydomonas, 76
Chloropseudomonas, 72
synthetase, 70
Chlorobium, 72
reductive carboxylic acid
cycle, 73
Kikuyu grass (Pennisetum)
aluminum toxicity, 517
Klebsiella pneumoniae
ATP requirement for N₂
fixation, 268-69
H₂ evolution, 267
maintenance energy require-
ment, 269
Nif genes, 263
nitrogenase derepressed
mutants, 264-65
nitrogenase synthesis con-
trol, 265
Klebsiella sp., 332

L
Lactobacillus spp., 391
malic enzyme, 389
Lagarsiphon major
photosynthesis saturation,
86
Lang, Anton, 7, 21
Larrea
see Creosote bush
Laties, G., 19, 21
Lauca
see Lettuce
Lead
exotype tolerance, 545-46
excretion, 544
soil availability, 543
toxicity
physiology, 543-44
sources, 536
translocation, 540
factors affecting, 541
Lectins, 496
Leghemoglobin, 272
Lemon (Citrus)
fruit
induced CO₂ rise, 17
transpiration rate periodi-
city, 16-17
Lettuce (Lauca)
gibberellin
13-hydroxylation, 174
manganese toxicity, 527
injury type, 528
iron decrease, 527
iron deficiency, 527
tolerance inheritance,
531
Leucine, 37, 74, 199, 271
zoospore attractant, 467
Levulinic acid
 δ -aminolevulinic acid form-
ation, 105-6, 112
inhibition, 104, 112
oxygen requirement, 113
spinach, 108
Lichens
cyanobacterial phycobionts,
338
Ligase, 419, 423, 427
Light
 δ -aminolevulinic acid formation,
112
electrogenic pumps, 440
potassium uptake, 448
hyperpolarization, 443
manganese toxicity, 527
photosynthesis yield, 346
polar axis fixation, 490-91,
495

sodium efflux/potassium
influx, 449
see also Photosynthesis appa-
ratus energy distribution
Lily (Lilium)
hybrid failure to form chias-
mata, 420
meiosis
crossing-over reduction,
433
crossover frequency, 435
DNA nicking at pachytene,
418-19, 427
DNA reannealing, 428-29
DNA repair, 422
pachytene DNA, 426
pathway, 433
R-protein, 430
zygotene DNA synthesis,
424
microfilaments, 504
Limonium spp.
chloride uptake, 452
ATPase, 452
Linum
see Flax
Luckwill, L. C., 8
Luminescence
see Delayed fluorescence in
photosynthesis, 48
Lupine (Lupinus)
iron tolerance, 534
leaf site determination,
244
Lutoids, 197
arginine/lysine transport,
201
citrate transport, 203
ion content, 198
rRNA presence, 198-99
Lycopodium
see Tomato
Lysine, 199-200
transport in vacuoles, 201
zoospore attractant, 467
Lysosome
heterocyst isolation, 324-25
Lysyl-tRNA synthetase
thermolability, 31
M
Magnesium
aluminum toxicity, 521
effect
on fluorescence, 51
on nickel toxicity symptoms,
542
farnesylpyrophosphate,
155

602 SUBJECT INDEX

- ent-kaurene synthetase
 - activity, 158
- manganese uptake decrease, 524
- metal resistance of fungi, 547
- photosynthesis, 347-48
 - effect on energy distribution, 357
 - effect on tripartite model, 376-77
 - energy transfer, 361
- R-protein, 430
- vacuolar accumulation, 197
- lutoids, 198
- Maize (*Zea*)
 - aluminum toxicity, 520
 - canopy
 - seed filling, 304
 - water use efficiency, 294-95
 - cell membrane resistance, 444
 - crossing-over studies, 417
 - etioplast biogenesis, 218
 - maternal plastid inheritance, 231
 - pachytene DNA sequences, 426
 - photosynthesis rate, 230
 - secretory vesicle movement, 504
 - theoretical yield, 228
 - translation recovery, 34
 - see also Corn
- Malate, 230
 - Calvin cycle repression, 71
 - chelating agent, 520
 - zinc tolerance, 547
- dehydrogenase, 69, 389
- Anacystis, 75
 - lack in blue-green algae, 74
- glutamic acid synthesis, 71
- sugar synthesis, 83
- synthesis, 71
- Malic acid
 - compartmentation, 396
 - conversion to glucan, 420
 - crassulacean acid metabolism, 205
 - deacidification, 394-95, 400-2
 - decarboxylation, 392
 - pathways, 395
 - localization, 197, 205
 - phosphoenolpyruvate carboxylase inhibition, 399, 401
 - during deacidification, 402
 - synthesis, 403
 - carbohydrate source, 393
 - and CO₂ fixation, 389-92
 - NADH requirement, 394
 - phase 4, 402
 - regulation, 398-400
 - under stress, 403
 - turgor pressure, 205
 - see also Crassulacean acid metabolism
- Maltose
 - heterocysts, 330
- Malus
 - see Apple
- Manganese
 - chelates in xylem, 540
 - concentration, 533
 - differential tolerance, 525
 - internal tolerance, 526-27
 - manganese and rhizobia, 530-31
 - mineral elements interaction, 527-29
 - organic complexes, 529-30
 - plant injury types, 528
 - uptake and transport, 525-26
- geranylgeranylpyrophosphate, 155
- gibberellin-aldehyde metabolism, 166
- enzyme inhibition, 167-68
- heterocysts, 327
- iron toxicity decrease, 532
- toxicity
 - acidic soils, 512
 - genetic control, 531
 - iron, 534, 542
 - physiological and biochemical effects, 524-25
 - plant symptoms, 523
 - wet soil effect, 525
- Mango (*Mangifera*)
 - ethylene and flowering, 7
- Mangrove (*Avicennia*)
 - ATPase, 450
- Mannitol, 396
 - heterocyst isolation, 325
 - osmotic balance adjustment, 132
- α -Mannosidase
 - localization, 199
 - vacuole, 206
- Marah macrocarpus
 - gibberellin-aldehyde pathway, 184
 - ent-kaurene synthesis, 155
- ent-kaurene synthetase, 180, 183
- ent-kaurenoids synthetic sequence, 159
- Maytenus brevifolia
 - manganese, 529
- Medicago
 - see Alfalfa
- Meiotic crossing-over regulatory mechanisms, 415-36
 - background, 415-16
 - crossing-over characteristics, 416
 - DNA segments insertion, 416
 - chromosome breaks, 417-19
 - DNA breakage regulation, 419-22
 - DNA prophase synthesis sites, 423-26
 - pachytene DNA, 426
 - positive interference, 424
 - molecular setting, 416-17
 - crossover definition, 417
 - diagram, 418
 - gene conversion, 417
 - nicking to crossing-over transition, 427-32
 - histones, 428
 - protein effect, 428
 - reassociation protein, 429
 - R-protein, 430-32
 - U-protein, 429-32
 - repair of chromosome breaks, 422-23, 428
 - speculations, 432
 - crossover regulation scheme, 434
 - meiosis process, 432
 - phase II, 434
- Membrane
 - function and cell injury, 36
 - hydrostatic pressure effect, 35
 - involvement in translation regulation, 35-36
 - low temperature injury involvement, 34
 - morphology and translation, 37
 - polar cell formation, 495
 - translation control initiation, 32-33
 - see also Turgor- and osmoregulation physics
- Membrane potential, 438, 443
 - vs cell membrane resistance, 444

- Membrane transport energy coupling, 437-60
- anion transport
- anion-ATPase, 452-53
 - ATP vs redox energy, 450-52
 - hydrogen cotransport, 452
- electrogenic hydrogen ion efflux, 439-40
- electrogenic pumps characterization, 440
- Acetabularia, 444
- characean cells, 443-44, 452
- electric potential, 440
- equivalent circuit, 441
- higher plant cells, 444-45
- kinetic control, 442
- Neurospora, 442-43
- Riccia, 444
- summary, 445
- organic molecules transport
- algae, 446-47
 - bacteria, 445-46
 - fungi, 446
 - higher plants, 447
- potassium transport, 447-48
- primary and secondary transport processes, 438
- animal cells, 439
 - bacteria, 438-39
 - plant cells, 439
 - proton-motive force, 438-39
- sodium transport
- ATPase, 450
 - efflux, 450
 - potassium/hydrogen influx, 449-50
 - summary, 453-54
- Mercaptopyruvic acid, 182
- Meromyosin, 504
- Mesembryanthemum crystallinum
- dark CO₂ fixation, 386
 - stress-hardening effect, 130
 - turgor regulation half-time, 131
 - volumetric elastic modulus values, 130
- nodiflorum
- CAM induction, 386, 407
- Mesquite (Prosopis)
- water use efficiency, 296
- Metal toxicity, 511-66
- aluminum general effects
 - physiological effects, 514
 - symptoms, 513 - beneficial effects of aluminum, 522
 - chelation, 539
 - conclusion, 547-48
 - differential aluminum tolerance, 514
 - ammonium vs nitrate nutrition, 515
 - calcium nutrition, 517
 - minerals uptake, 521-22
 - organic aluminum complexes, 520 - pH changes in root zones, 514-15
 - phosphorus nutrition, 517-20
 - uptake and translocation, 516-17
- differential manganese tolerance, 525
- internal tolerance, 526-27
 - manganese and rhizobia, 530-31
 - mineral elements interaction, 527-29
 - organic complexes, 529-30
 - plant injury types, 528
 - uptake and transport, 525-26
- genetic control
- aluminum tolerance, 522-23
 - manganese tolerance, 531
- introduction, 512-13
- iron
- differential tolerance, 534-35
 - general occurrence and importance, 531
 - symptoms, 532
 - toxicity physiology, 533
- labile pool, 538
- manganese toxicity
- physiological and biochemical effects, 524-25
 - plant symptoms, 523
- other elements
- absorption, 539
 - agricultural chemicals and urban wastes, 536-37
 - air and water pollution, 536
 - cultivar differential tolerance, 545
 - differential tolerance, 545
 - ecotype differential tolerance, 545-46
 - interactions with nutritional elements, 541-43
 - metal equilibria in soils, 537-38
 - movement from soil to roots, 538-39
 - natural occurrence, 535-36
 - occurrence and importance, 535
 - physiology and biochemistry, 543
 - symptoms, 541-43
 - tolerance mechanisms, 546-47
 - translocation, 539-41
- Methane, 68
- Methanol, 68
- Methionine, 18, 502-3
- Methionine sulfoximine, 329
- effect on glutamine synthetase, 332
 - nitrogenase production, 265-66
- Methylethylmaleimide, 108
- 3-O-Methyl glucose, 446
- S-Methyl-L-methionine, 197
- Methylviologen, 360
- Mevalonic acid
- gibberellin
 - complete synthesis system, 168
 - metabolite identification, 154 - gibberellin-aldehyde synthesis, 151, 162, 166, 184
 - mevalonic acid to entkaurene, 155-58
 - pathway, 156
 - synthesis in chloroplasts, 183
- Mevalonic acid kinase, 155
- loss in plastids, 183
- Micrococcus cryophilus
- amino acids-tRNA binding impairment, 31
 - protein synthesis impairment, 30
 - temperature and RNA synthesis, 27
- Microfilaments, 494, 497, 503, 506
- cell membrane stabilization, 496
 - orientation, 505
- Microplasmodesmata, 321, 323
- Microsporocytes, 415
- Microtubules, 492, 497
- cellulose microfibril orientation

604 SUBJECT INDEX

- tion, 246
- membrane stability, 496
- protein synthesis, 38
- Milk vetch (*Astragalus*)
 - aluminum beneficial effect, 522
- Mimosa spp.
 - action potential, 136
- Mirabilis jalapa
 - plastid inheritance, 217
- Mitochondria
 - δ -aminolevulinic acid synthetase, 114
 - ATP production, 448
 - bacteroid similarity, 271
 - chloroplast biosynthesis, 225
 - NAD malic enzyme, 392, 401
 - phosphoenolpyruvate carboxylase, 391
 - rhizoids, 492
- Molybdenum
 - effect on aluminum toxicity, 521
 - heterocyst differentiation, 333
 - frequency, 335-36
 - manganese absorption, 528-29
- Monochrysis lutheri
 - osmotic balance regulation, 132
- Morning glory (*Ipomoea*)
 - ribonuclease localization, 208
- Morphactins
 - flower initiation, 7
- Morphine localization, 197
- Mougeotia spp.
 - actin filaments, 504
- Mouse fibroblast L cells
 - protein synthesis
 - inhibition, 34
 - regulation, 32
- Mucorales
 - β -carotene, 475-76
 - pheromones, 475
- Mucor mucedo
 - trisporic acids, 476
- Mulga (*Acacia*)
 - contour-oriented groves, 284
- Multifidene, 469
- Musa
 - see Banana
- Mustard (*Brassica*)
 - manganese toxicity
 - internal levels, 526-27
 - phytochrome involvement in greening, 113
- Myriophyllum spicatum
 - bicarbonate utilization, 86
 - carbon metabolism, 86-87
 - CO₂ compensation rate, 86
 - photosynthesis saturation, 86
 - photosynthetic rates, 85
- N
 - Naja flexis
 - photorespiration, 86
 - Naphthalene acetic acid, 7
 - Nasturtium officinale
 - shoot redetermination, 257
 - Neurospora crassa
 - arginine/ornithine location, 196
 - arginine-specific permease, 200
 - Neurospora spp., 453
 - ATP
 - electrogenic pump, 442-43
 - and membrane potential, 442
 - potassium
 - transport, 448
 - uptake, 448
 - proton uptake, 446
 - sugar transport, 446
- Nickel
 - ecotype tolerance, 545
 - mechanism, 546
 - labile pool, 538
 - metalloenzyme, 545
 - sulfur dioxide interaction, 542
 - toxicity, 536
 - iron interaction, 541
 - study, 544
 - symptoms, 542
 - translocation, 540
 - zinc deficiency, 544
- Nicotiana
 - see Tobacco
- Nicotinamide adenine dinucleotide (NAD)
 - NAD malate dehydrogenase, 392
 - NAD malic enzymes, 397, 403
 - malic acid mobilization, 401-2
- NADH oxidase
 - lack in blue-green algae, 74
- NADP malate dehydrogenase, 401
- NADP malic enzyme, 400, 403
 - allosteric properties complex, 401
 - pH profile, 399
- Nif genes, 331
 - derepression, 264
 - Klebsiella, 263
 - nitrogenase code, 327
 - operon transcription regulator, 332
 - see also Heterocysts
- Nitella
 - axillaris
 - turgor pressure measurement, 123
 - flexilis
 - volumetric elastic modulus values, 130
 - translucens
 - chloride influx, 451
 - electrogenic pump, 443-44
- Nitella spp., 504
 - actin filaments, 504
 - localization
 - acid phosphatase, 208
 - carboxypeptidase, 208
 - microfilaments, 496
 - turgor regulation, 128
 - volumetric elastic modulus, 129
- Nitellopsis obtusa
 - volumetric elastic modulus values, 130
- Nitrate
 - nutrition
 - aluminum toxicity, 515
 - reductase, 272, 515
 - nitrate toxicity, 515
 - toxicity, 515
 - uptake decrease of aluminum, 521
- Nitrogen
 - fixation
 - manganese toxicity, 530
 - requirements, 325
 - see also Heterocysts
- Nitrogenase, 264
 - catalyzed H₂ evolution, 267-68
 - heterocysts, 331
 - isolation, 325
 - purification, 331
 - molybdenum, 335
 - nif gene, 327
 - protection
 - heterocysts, 320
 - synthesis repression, 265
 - see also Nitrogen fixation
- Nitrogen fixation, 263-76

- energy cost, 266-67
 apparent ATP requirement, 268-69
 nitrogenase catalyzed H_2 evolution, 267
 introduction, 263-64
 nif genes, 263
 nif genes derepression, 264-66
 symbiotic fixation, 269-71
 unified concept, 271-74
 hydrogen uptake, 272-73
 Nitrosoguanidine, 336
 Nitsch, J. P., 8
 Norleucine, 334
 Nostoc muscorum, 322
 photoautotrophy, 74
 Nostoc spp.
 ferredoxins, 327
 heterocyst
 differentiation, 333
 study, 322
 symbionts, 337-38
 fixed nitrogen excretion, 338
 NP-40, 324
 Nucleoli
 heating effect, 27-28
 Nucleus
 role in chloroplast biogenesis, 218, 221
 Nuphar spp.
 floral bud initiation, 249
 Nymphaea spp.
 floral bud initiation, 249
 Nystatin, 198, 200
- O
- Oat (*Avena*)
 chlorophyll formation, 108
 etioplast cultures, 418
 manganese deficiency, 526
 nickel toxicity symptoms, 542
 turgor regulation, 205
 Obligate photoautotrophy, 67-93
 algae, 73-74
 Athiorhodaceae
 photoautotrophy and photoorganotrophy, 70-71
 photomixotrophy, 71-72
 blue-green algae, 74-75
 β -carboxylation in algae, 76-77
 Chlorobacteriaceae
 obligate photoautotrophy, 72-73
 conclusion, 87-88
 green algae, 75-76
 introduction, 67-69
 classes, 68
 higher plants, 68
 occurrence, 67-68
 photosynthetic bacteria, 69
 submerged freshwater angiosperms
 anatomy and $\delta^{13}C$ values, 87
 carbon metabolism, 86-87
 CO_2 compensation points, 86
 photosynthetic characteristics, 85-86
 submerged marine angiosperms
 carbon isotope fractionation model, 80-81, 84
 interpretation of $\delta^{13}C$ values, 79-85
 obligate photoautotrophy, 78
 photosynthetic characteristics, 78-79
 stable carbon isotopes
 fractionation, 79-85
 Thiordhodaceae
 facultative photoautotrophy, 69-70
 Ochromonas malhamensis
 isofluoridoside synthesis
 initiation, 133
 nonosmotic volume, 127
 osmoregulation, 126-27, 133
 osmotic balance adjustment, 132
 n-Octane, 468
 Octatrienes, 469
 Oedogonium cardiacum
 boriseanum
 androspore attractant, 472
 life cycle, 472
 cardiacum
 sexual structures induction, 471
 sperm attractant, 471
 Oedogonium spp.
 flagellar ring, 472
 pheromone study suitability, 472
 swimming patterns during chemotaxis, 472
 Oligomycin, 451
 Olive (*Olea*)
 gibberellin
 2β -hydroxylation, 174
 Onion (*Allium*)
 DNA-replication prevention
 aluminum, 519
 manganese toxicity, 528
 iron antagonism, 527
 water permeability, 137
 Oogoniol, 473-75
 activity, 473
 Opuntia
 bassilaris
 carbon dioxide fixation, 384
 inermis
 carbon dioxide fixation, 406
 night temperature effect on CAM, 387
 resistance to water loss, 385
 polycantha
 crassulacean acid metabolism, 383
 spine vs leaf initiation, 250-51
 Opuntia spp.
 crop growth rate, 386
 irrigation
 CO_2 fixation, 385
 root formation, 384
 NADP malic enzyme isoenzymes, 392
 Ornithine, 199-200
 localization in *Neurospora*, 196
 Ornithogalum spp.
 cold
 crossing-over reduction, 433
 Orthophosphate, 202
 vacuolar accumulation, 197
 Oryzae
 see Rice
 Osmotic pressure
 see Turgor- and osmoregulation physics; Turgor pressure
 Osmunda cinnamomea
 leaf primordia, 252
 older leaf effect, 253
 phases, 254
 Ouabain, 37, 449-50
 Oxalic acid, 520
 Oxaloacetate, 76, 389
 malic acid oxidation, 401
 Oxaloacetic acid, 230
 Oxidative pentose phosphate cycle, 75
 Oxidoreductase
 membrane association, 199
 2-Oxoglutarate, 330-31, 333

606 SUBJECT INDEX

- ent-15-Oxokaurenoic acid,
177
- Oxygen
chlorophyll synthesis, 113
S states, 54-55
- Ozone
metal interactions, 542
- P
- P700, 366
heterocysts, 327
photooxidation, 361-64
Porphyrin, 368
PS I model, 352-53
- Pachytene
DNA
fractions, 425-26
nicking, 417-19, 421
synthesis, 422-25, 430
- Papaver somniferum
morphine localization, 197
- Paramecium spp., 482
- Pea (Pisum)
aluminum
effects, 517-18
localization, 519
nitrate uptake decrease,
521
phosphorus interaction,
519
tolerance, 514
uptake, 517
cell membrane resistance
carbon monoxide, 445
vs membrane potential,
444
chlorophyll/carotenoid bio-
synthesis
genetic block, 222
chloroplast DNA sequences,
220
- gibberellin
gibberellin-aldehyde con-
version, 168, 184
glucosyl esters, 182
ent-7 α -hydroxykaurenic
acid synthesis, 159
ent-kaurene synthetase,
180, 183
metabolite identification,
154
native gibberellins, 169-
70
pathways from GA-aldehyde,
169-71
- leaf primordia initiation,
246
cell division rate, 247
theoretical requirements,
247
manganese toxicity
internal level, 526
phosphofructokinase, 399
photosynthetically positive
mutants, 232
PS II genetic defect, 223
plastid
protein synthesis rate,
224
RNA synthesis rate, 224
- Peach (Prunus)
aluminum benefit, 522
calcium uptake
aluminum interference,
517
iron/aluminum ratio, 521
iron-induced manganese
toxicity, 532
zinc spray, 537
- Peach little leaf, 3
zinc deficiency, 3-4
- Peanut (Arachis)
manganese
organic complex, 530
sensitivity, 525
phenology, 298
- Pear (Pyrus)
15 β -hydroxy gibberellin,
177
- Pelargonium zonale
PS I genetic defect, 223
plastid inheritance, 217
- Pelvetia fastigiata
cortical clearing, 493
ion fluxes, 494
rhizoid formation site, 493-
94
transcellular current, 494
- Penicillium
digitatum
ethylene synthesis, 18
fruit CO₂ production rise,
17
italicum, 17
- Pennisetum
see Kikuyu grass
- Pepper (Capsicum)
turgor pressure measure-
ment, 125
- Peroxidase isozymes
fruit ripening, 10
- Persea
see Avocado
- Petunia
microfilaments, 504
- pH
aluminum benefit, 522
aluminum toxicity, 512,
517
organic-aluminum com-
plexes, 520
pH changes in root zones,
514-15
of bay water, 82, 84
bicarbonate utilization
photosynthesis, 16, 84
delayed fluorescence, 51-54
stimulation, 60
electrogenic pumps, 440,
443-44
insensitivity, 444
potassium uptake, 448
gibberellin metabolism, 164-
65
- iron
tolerance, 534
toxicity, 531-32
manganese toxicity, 512-13,
526-27, 530-31
membrane potential, 439,
443
- metal
equilibria in soil, 537-38
movement from soil to
roots, 538-39
translocation, 541
- profile
NADP malic enzyme, 399
prompt fluorescence, 52
proton-dependent transport
systems, 446
rhizoid formation, 490
- Phaeodactylum tricornutum
CO₂ fixation, 77
- Pharbitis nil
gibberellin glucosyl ethers,
181
- Phaseolus
see Bean; Gram; Snap bean
- Phenology
annuals, 298-99
definition, 298
perennials, 299
- Phenylalanine, 99, 109
- Pheromones in algae and
fungi, 461-86
conclusion, 481-82
flagellar activity alteration,
482
function, 482
pheromone origin, 481
introduction, 461-63
pheromone classification,
462
pheromone properties, 463
terms, 462
sexual attractants, 464
Allomyces, 465-68
biosynthetic pathway, 470

- brown algae, 468-71
 Chlamydomonas, 464-65, 471
 evolution, 470
 Oedogonium, 471-72
 Sphaeroplea, 472
 sexual differentiation induction
 Achlya, 473-75
 ascomycetes, 480
 Mucorales, 475-77
 Volvox, 477-80
 Phosphate
 deficiency effect, 532
 foliar lead decrease, 540
 lead translocation, 541
 Phosphoenolpyruvate, 76, 394, 398-400, 403
 carboxykinase, 392, 397
 acid decarboxylation products, 395
 malic acid deacidification, 401
 crassulacean acid metabolism
 β -carboxylation, 390
 source, 389
 export to cytoplasm, 394
 fate during deacidification, 394-95
 malic acid synthesis, 393
 phosphofructokinase sensitivity, 399
 photoautotrophy, 69-70
 Phosphoenolpyruvate carboxylase, 77-78, 85, 87, 230, 390-91, 402-4
 activity
 C₃ plants, 231
 carbon isotope fractionation, 79-81
 crassulacean acid metabolism, 389, 399, 405
 acid synthesis regulation, 400
 glucose-6-phosphate activation, 399
 localization, 391-92, 394
 malic acid inhibition, 399, 401
 during deacidification, 402
 synthesis
 response to water stress, 398
 Phosphofructokinase, 393, 400
 sensitivity to phosphoenolpyruvate, 399, 404
 6-Phosphogluconate, 69-70, 73, 77, 87
 bicarbonate utilization product, 84
 6-Phosphogluconate dehydrogenase, 75, 328
 2-Phosphoglycerate, 402
 3-Phosphoglycerate, 389, 402
 crassulacean acid metabolism, 391
 phosphoenolpyruvate source, 402
 Phosphoglyceromutase, 402
 Phosphon D, 158
 Phosphorus
 aluminum tolerance association, 517-20
 root phosphatase, 519-20
 copper-induced chlorosis, 542
 fertilizers
 cadmium source, 537
 manganese toxicity decrease, 529
 metal toxicity, 541
 uptake, 539
 Phosphorylase, 392
 Acetabularia cap regeneration, 498-99
 enzyme distribution, 499
 Photoautotrophy
 see Obligate photoautotrophy
 Photorespiration, 232
 CO₂ release, 232
 measurement, 233
 Photosynthesis
 solar energy efficiency, 227
 see also Delayed fluorescence in photosynthesis
 Photosynthesis apparatus
 energy distribution, 345-78
 bipartite model
 photochemical apparatus model, 353-57
 PS I model, 352-53
 PS II model, 348-52
 vs tripartite model, 377
 bipartite model application
 to chloroplasts
 divalent cations effect, 357-58
 PS II to PS I energy transfer, 360-61
 wavelength dependence of energy distribution, 358-60
 bipartite model application
 to flashed leaves
 energy distribution wavelength dependence, 362-65
 PS I / PS II / ChlLH emission spectra, 364-65
 PS II to PS I energy transfer, 361-62
 bipartite model application
 to red algae
 energy distribution wavelength dependence, 365-67
 experimental verification, 368-69
 PS II to PS I energy transfer, 367-68
 introduction, 346-48
 divalent cation effect, 347
 photochemical models, 347
 spillover hypothesis, 346
 Z scheme, 346
 tripartite model
 coupling parameters quantitative assessments, 374-76
 energy coupling and energy transfer, 373-74
 energy coupling and F_v extent, 372-73
 equations, 369-72
 magnesium effect on parameters, 376-77
 vs bipartite model, 377
 Photosynthesis genetics and crop improvement, 215-37
 chloroplasts
 genetic regulation scheme, 224
 crop improvement, 227-30
 germplasm analysis and mobilization, 230-33
 means, 228
 phenotypic expression scheme, 229
 theoretical yields, 228
 high photosynthetic productivity requirements, 232
 introduction, 215-16
 photosynthesis genetics, 216
 definition, 216
 DNA-RNA hybridization, 220
 history, 217-18
 nuclear-induced plastome mutants grouping, 221
 nuclear-plastid genetic complementation, 218-24
 translation and regulation sites, 224-26
 variegated leaves, 218-19

- pigment-protein complexes, 223-26
 see also Chloroplasts
 Photosystem I, 48, 50, 52-53, 327, 346
 absorption band, 359
 C₄ plants, 230
 emission spectra, 364-65
 energy transfer from PS II chloroplasts, 360-61
 flashed bean leaves, 361-64
 red algae, 367-68
 genetic block, 223
 heterocysts, 320
 low temperature, 57
 photochemical model, 347, 352-53
 Porphyrin, 366
 protein formation inhibition, 226
 see also Photosynthesis
 apparatus energy distribution
 Photosystem II, 56
 delayed fluorescence, 48, 50, 52-53
 decay component, 56
 emission spectra, 364-65
 energy transfer between units, 373-74
 coupling parameters, 374-76
 magnesium effect, 376-77
 energy transfer to PS I chloroplasts, 360-61
 flashed bean leaves, 361-64
 red algae, 367-68
 genetic defect, 223
 heterocysts, 326-27
 photochemical model, 347-52
 dead fluorescence, 349
 matrix model, 350-52
 primary electron donor, 348
 quenching mechanisms, 349
 separate package model, 350-52
 phycochlorophylls, 320, 324, 326
 Porphyrin, 366
 protein formation inhibition, 226
 secondary electron transport, 53-54
 decay kinetics, 56-57
 low temperature emission, 57-58
 S states, 54-55, 61
 thermoluminescence, 58-60
 spillover hypothesis, 346
 see also Photosynthesis
 apparatus energy distribution
 Phycobilins, 98, 111, 326, 365, 367
 Phycobiliproteins, 320, 324, 326, 336
 Phycobilisomes, 366
 Phycocyanin, 49, 366-67
 degradation, 335
 synthesis, 326
 Phycocyanobilin, 111
 Phycoerythrin, 366
 Phycomyces blakesleeana
 sexuality induction, 476
 Phycomyces spp.
 carotene role, 477
 Physarum polycephalum
 DNA synthesis, 26
 protein synthesis impairment, 30
 RNA degradation, 30
 RNA synthesis, 27
 heating effect on nucleoli, 28
 thermal injury repair, 33-34
 Phytic acid, 204
 Phytochrome
 gibberellins, 183
 synthesis regulation, 180
 system
 greening process, 113
 Phytotron, 6
 Picea sitchensis
 gibberellins, 173
 glucosyl esters, 182
 see also Spruce
 Piezoelectricity, 142
 Pimaradiene, 157
 Pineapple (Ananas)
 crop growth rates, 386
 flowering success, 7
 water use efficiency, 296
 Pinguicula spp.
 floral buds, 249
 Pinus attenuata
 gibberellins, 173-74
 Pisum
 see Pea
 Plant physiology
 see Horticulture-plant physiology interface
 Plant productivity, 277-317
 assimilate partitioning, 297-300
 annuals phenology, 298-99
 harvest index, 304
 perennials phenology, 299
 phenology definition, 298
 photosynthetic tissue, 299-300
 reproductive tissues, 301-2
 roots, 300-1
 seed filling, 303-4
 seed number, 302-3
 environmental context
 arid and semiarid zones
 definition, 278-79
 soil water models, 280
 water availability patterns, 279-80
 integration and conclusions, 30-10
 net primary productivity, 305
 undesirable traits, 308
 water use efficiency variation, 306
 introduction, 277-79
 water limiting factor, 277-78
 plant forms and productivity
 models, 280
 aridoactive plants, 281
 aridopassive plants, 281
 plant forms distribution, 282
 pulse-reserve model, 280
 water use efficiency, 282
 regions
 mediterranean, 279-80
 savanna, 279
 steppe, 279-80
 transition, 279-80
 transpiration
 calculation, 283
 changes in leaves, 287
 leaf area reduction, 289
 plant water potential and survival, 290
 potential, 287
 runoff, 283-84
 soil evaporation, 284-85
 soil water change, 285-86
 transpiration modulation, 286-89
 water use efficiency, 305
 air saturation deficit, 291
 based on dry matter accumulation, 295-97
 C₃ vs C₄ plants, 293
 canopies, 294-95
 definition, 290

- incident irradiance, 291-92
- leaf traits, 292-93
- single leaf, 290
- stomata behavior, 294
- Plasmalemma, 211, 448
- aluminum passage, 516
- ATPase, 453
- chitin synthetase, 208
- chloride transport, 450-51
- concanavalin A binding, 198
- polysaccharide coat, 200
- sodium transport, 449
- solute extraction from cells, 195
- permeability induction, 196
- Plasma membrane
- actin, 496
- Plastid
- C₄ plants, 230
- DNA genes, 221
- genome
- mutations, 219
- replication character, 217
- gibberellin synthesis, 182-84
- early steps, 183
- inheritance, 217
- nuclear-plastid gene expression control, 225
- pigment formation control, 222-23
- protein synthesis
- chromosomal DNA, 225
- RNA polymerase
- inducer control, 224
- see also δ -Aminolevulinic acid and plastids; Chloroplast; Photosynthesis genetics and crop improvement
- Plastochron, 246, 251
- gibberellin effect, 251
- Plastocyanin, 327
- Plastogenes, 226
- Plastome, 219, 225
- mutant groups, 221
- Plastoquinone, 327
- Platymonas subcordiformis
- nonosmotic volume, 127
- osmoregulation, 127
- osmotic balance regulation, 132
- potassium uptake, 133
- Plectonema spp., 327
- Pleurodeles waltlii
- heating effect on nucleoli, 27
- Polygalacturonase, 519
- Polynucleotide kinase, 423, 427
- Polyoxon D, 500
- Polyphenylalanyl-tRNA, 32
- Polyposphate, 204
- vacuolar transport mechanism, 202-3
- Polypodium spp., 498
- Polysiphonia spp., 498
- Polysomes
- endoplasmic reticulum association, 35
- membrane complexes, 32-33
- Poplar (Populus)
- aluminum-phosphorus interaction, 518
- Populus deltoides
- primary vascular system development, 243-44
- Porphyra perforata
- osmotic balance regulation, 132
- Porphyridium cruentum
- energy distribution in photosynthesis, 365-68
- Potassium, 529, 535
- action potentials, 142
- aluminum toxicity, 521
- ATPase, 448-49
- effect
- delayed fluorescence, 61
- electrogenic pumps, 440
- flux, 140, 445, 449-50
- hydraulic conductivity, 137
- membrane conductivity, 134
- reversible change, 141
- localization, 198
- osmoregulation reverse, 142
- rhizoid formation, 490
- transport, 447-48
- turgor pressure, 205
- effect on influx-efflux, 134-35
- indoleacetic acid, 135
- turgor pressure adjustment, 131
- Ochromonas, 132
- uptake, 133
- uptake, 539
- Potato (Solanum)
- aluminum tolerance, 521
- δ -aminolevulinic acid synthetase, 102
- label incorporation pattern, 107
- manganese toxicity, 524
- Primula spp.
- floral apex development, 249
- Primulin, 196
- Proheterocyst formation, 334-35
- Proline, 74
- osmotic balance regulation, 132
- zoospore attractant, 467
- Prompt fluorescence, 53
- emission spectra, 48
- bacteriochlorophyll a, 49
- phytylcyanins, 49
- factors affecting, 51
- pH, 52
- Pronase, 200, 478
- Proplastids
- gibberellin synthesis, 183
- Prosopis
- see Mesquite
- Protease
- bacterial virus gene expression, 320
- Protein
- synthesis inhibition, 36-37
- see also Heat effects on protein synthesis
- Proteinase A, 206-8
- Proteinase B, 500
- Protochlorophyll, 225
- Protochlorophyllide, 110-13, 223, 225
- Protoporphyrin IX, 96, 113
- chlorophyll pathway regulation, 110
- formation, 108, 114
- structure, 97
- Prunus
- see Apricot; Peach
- Pseudotsuga menziesii
- gibberellins, 173
- see also Douglas fir
- Pulse-reserve model, 280
- Pyromycin, 20, 452
- Pyridoxal phosphate cofactor, 99-100
- Pyrus
- see Pear
- Pyruvate, 71, 76, 401, 405
- fate during decarboxylation, 394-95
- kinase, 231, 394-95
- Pyruvate orthophosphate
- dikinase, 395, 397
- dark inactivation, 401
- light activation, 404
- Pyruvate synthase, 72
- Chlorobium, 72
- reductive carboxylic acid

610 SUBJECT INDEX

- cycle, 73
- R
 - Recombination hypothesis, 48
 - emission yield, 50-52
 - excited reaction center pigment, 49
 - exciton yield, 50-52
 - primary charge pair, 50
 - rate constant, 50-52
 - Reductive pentose phosphate cycle, 82
 - Rhamnose, 498
 - Rhizobium
 - japonicum
 - fixed nitrogen export, 270-71
 - lectin binding, 502
 - phaseoli
 - manganese toxicity, 530
 - trifolii
 - ammonium utilization, 271
 - Rhizobium spp.
 - ammonium assimilation
 - enzyme modulation, 271
 - inhibition, 274
 - fixed nitrogen excretion, 270-71
 - nif genes, 269
 - derepression, 263
 - supporting pathways, 270
 - relative energy efficiency, 273
 - Rhizoid, 489-90
 - see also *Fucus* spp.; Cell polarity development
 - Rhizophore, 254
 - shoot dimorphism, 255-57
 - Rhodospseudomonas
 - spheroides
 - δ -aminolevulinic acid formation, 98-99
 - δ -aminolevulinic acid synthetase, 100
 - γ - δ -dioxovaleric acid, 103
 - fluorescence emission spectra, 49
 - α -hydroxyglutarate conversion, 109
 - thermoluminescence bands, 60
 - viridis
 - delayed fluorescence, 52
 - delayed fluorescence requirements, 50
 - factors affecting delayed fluorescence, 51
 - fluorescence emission spectra, 48-49
 - thermoluminescence, 60
 - Rhodospirillum rubrum
 - ammonia assimilation, 265
 - Calvin cycle, 70, 73
 - citramalate pathway, 71-72
 - glutamate synthesis, 71
 - Ribonuclease
 - localization, 208
 - vacuole, 206
 - Ribonucleic acid, 250, 335
 - Acetabularia cap regeneration, 498
 - fruit ripening, 20
 - heat effect
 - degradation, 29
 - synthesis, 29-30
 - thermal injury repair, 33
 - plastid
 - synthesis rate, 224
 - plastochron, 247
 - synthesis rate, 248
 - synthesis
 - antheridiol effect, 473
 - chloroplast, 226
 - mRibonucleic acid, 27, 31, 320
 - cap regeneration, 498
 - chloroplasts, 217
 - DNA hybridization, 220
 - nuclear translation, 225
 - ribulose biphosphate carboxylase, 226, 231
 - transcription onto DNA, 220
 - cold
 - translation initiation inhibition, 34
 - heat
 - degradation, 30
 - ribosome association, 32
 - membrane association, 35
 - nuclear
 - transport into chloroplasts, 225
 - rRibonucleic acid, 27
 - heat degradation, 29-30
 - ribosome damage, 30
 - occurrence in luteoids, 198-99
 - transcription
 - selective inhibition by heat, 28
 - tRibonucleic acid, 225, 337
 - chloroplasts, 217
 - DNA hybridization, 220
 - heat changes, 32
 - Ribonucleic acid polymerase, 217, 320, 474
 - differential heat sensitivity, 28
 - 28
 - plastid
 - inducer control, 224
 - thermostability, 29
 - Ribosomes
 - chloroplast, 217
 - heat
 - mRNA association, 32
 - thermostability, 30-31
 - Ribulose-1,5-bisphosphate, 393
 - crassulacean acid metabolism, 389, 391
 - Ribulose-1,5-bisphosphate carboxylase, 70, 77, 82, 84, 87, 115, 390, 394-95
 - absence
 - from heterocysts, 328
 - mesophyll, 230
 - carbon isotope fractionation, 79-80
 - chloroplast, 391
 - chloroplast mRNA transcription, 231
 - Chromatium, 73
 - CO₂ fixation, 83, 85
 - crassulacean acid metabolism, 391, 405
 - DNA code, 226
 - green sulfur bacteria, 72
 - peptide composition, 233
 - photorespiration, 232
 - Ribulose-1,5-bisphosphate carboxylase-oxygenase, 381, 391
 - Ribulose-1,5-bisphosphate cycle, 69
 - Ribulose bisphosphate oxygenase, 78
 - pathway
 - autotrophy, 68
 - Ribulose monophosphate, 68
 - Riccia fluitans
 - m-chlorophenyl hydrazine, 448
 - Riccia spp.
 - electrogenic pump, 444
 - Rice (*Oryza*)
 - aluminum
 - beneficial effect, 522
 - tolerance, 514, 516, 520, 534
 - toxicity, 532
 - gibberellin
 - 13-hydroxylation, 174
 - iron toxicity, 531-32
 - escape, 535
 - manganese effect, 531
 - physiology, 533
 - tolerance, 534

- manganese toxicity, 525
 internal levels, 526
 silicon, 529
 vs iron deficiency, 527-28
- Ricin, 502
- Ricinus spp.
 diterpene formation, 158
 ent-kaurene synthetase, 180
 proplastids, 183
 see also Castor bean
- Rifampicin, 225-26, 334-35
- R-protein, 430, 433-35
 regulatory features, 430-31
 U-protein interaction, 432
- Rye (Secale)
 aluminum tolerance, 523
 crossing-over sites, 424
 iron tolerance, 534
 metal toxicity symptoms, 542
- S
- Saccharomyces
 cerevisiae
 S-adenosyl methionine
 transport, 200-1
 arginine localization, 197
 arginine-specific permease, 199-201
 carboxypeptidase Y, 203
 glutamic acid, 197
 ion accumulation in vacuoles, 198
 lysyl-tRNA synthetase
 thermolability, 31
 α -mannosidase localization, 199
 nitrogen starvation, 204
 plasmalemma permeability
 induction, 196
 protein degradation, 209-10
 tonoplast properties, 198
 turgor regulation, 205
 vacuolar arginine pool, 202
 vacuolar proteolytic system, 206
 vacuolar transport model, 202-3
 uvarum
 glycine accumulation, 201
- Saccharomyces spp.
 proton uptake, 446
- Saccharum
 see Sugarcane
- Sachs, 21
- Salix
 see Willow
- Salmonella typhimurium
 rRNA degradation, 29
 ribosome damage, 30
- Sandarocopinadiene, 158
- Sanguinarine
 detoxification, 206
 localization, 197
- Sapromyces spp.
 pheromone, 475
- Scabiosa columbaria
 aluminum beneficial effect, 522
- Scenedesmus
 obliquus
 δ -aminolevulinic acid
 accumulation, 112
 cytochrome synthesis
 block, 223
- Scenedesmus spp., 48
 bicarbonate utilization, 84
 CO₂ fixation, 77
 delayed fluorescence, 57
 intensity, 54
 polyphosphate accumulation, 197
- Scopolia sinensis
 manganese toxicity, 524
- Secale
 see Rye
- Sedum
 acre
 CO₂/H₂O exchange, 384
 telephium
 CAM enzymes, 397
- Selaginella
 martensii
 rootcap development, 255
 wildenovii
 meristem determination, 255
- Selaginella spp.
 shoot-rhizophore dimorphism, 256-57
 undetermined meristems, 254
- Serine, 79
 carboxypeptidase Y, 206-8
 precursor, 207
 pathway
 autotrophs, 68
 proteinase B, 206, 208
- Sex hormone
 see Pheromones in algae
 and fungi
- Sexual pheromones
 see Pheromones in algae
 and fungi
- Shoot apex organogenesis, 239-62
 associated cytological
 changes, 245-48
 cell division rate, 245
 nucleic acids, 247-48
 periclinal divisions, 245
 polarized cell enlargement, 245
 conclusion, 256-58
 introduction, 239
 lateral organ initiation site
 determination, 239-45
 cellularity parameters, 241
 field theory, 241-42
 hormones, 244
 independent shoot apex, 240
 inhibitor diffusion, 241
 leaf-initiating stimuli, 240
 models, 240-41
 phyllotaxis alteration, 242
 preexisting leaf primordia, 240
 procambial traces, 242-43
 provascular strands, 243-44
 self-perpetuation, 242
 young primordia, 244
 lateral organ type determination, 248-54
 bud conversion, 254
 floral gradients, 249
 gibberellin, 250-51
 isolation, 252
 meristem structure change, 250
 organogenic factors, 249
 phyllotactic factors, 249
 physiological interface, 252
 meristem interconvertibility, 254-57
 auxin, 254-57
 rhizome, 257
 rhizophore, 254-55
- Silicon, 521
 iron toxicity, 533
 manganese toxicity, 529
- Simmonsia
 see Jojoba
- Sirenia, 465
 binding, 466
 bioassay, 465
 effect on swimming behavior, 467
 formation, 466
 structure, 466
- Siroheme, 96
- Skeletonema costatum
 Calvin cycle, 77

612 SUBJECT INDEX

- CO₂ fixation, 77
 Skizokinen, 521
 Snap bean (*Phaseolus*)
 aluminum toxicity, 515-16
 calcium, 517
 site, 518
 manganese toxicity
 effect on nodulation, 530-31
 Sodium
 efflux and proton gradient, 446
 localization, 198
 osmotically active molecules regulation, 131
 transport, 439, 448
 ATPase, 450
 efflux, 450
 efflux coupling with ion influx, 449-50
 vacuole, 450
 Soil water
 see Plant productivity
 Solanum
 see Potato
 Solomos, T., 19
 Sorbitol
 yeast vacuole stabilization, 196
 Sorghum, 279, 543
 iron deficiency chlorosis, 521
 manganese toxicity, 524
 metal toxicities, 542
 phenology, 299
 seed filling, 304
 soil water, 285
 stomatal closing, 289
 $\delta^{13}\text{C}$ values, 83
 water use efficiency, 292, 297
 Soybean (*Glycine*)
 aluminum tolerance, 515-16
 calcium, 517
 iron effect, 521
 δ -aminolevulinic acid synthetase, 101, 114
 cadmium toxicity symptoms, 542
 CO₂ compensation point, 86
 foliar lead, 540
 iron toxicity, 532, 534-35
 manganese interaction, 535
 lectin, 502
 manganese
 effect, 524, 529
 internal level and toxicity, 526-27
 sensitivity, 525
 nitrogenase catalyzed H₂ evolution, 267
 water use efficiency, 297
 zinc
 differential tolerance, 545
 manganese translocation, 541
 toxicity, 537, 542
 Spermatoocytes, 415
 Sphaeroplea spp.
 gamete attraction, 472
 Spinach
 δ -aminolevulinic acid accumulation, 108
 formation, 113
 chloroplasts
 emission spectra, 355
 excitation spectra, 360
 P700 photooxidation, 353
 PS II to PS I energy transfer, 361-62
 delayed fluorescence, 50, 57
 decay kinetics, 56
 temperature optimum, 57
 glycollate oxidase, 86
 manganese toxicity, 528
 sugar beet graft
 photosynthesis enhancement, 228
 Sporopollenin, 475
 Spruce (*Picea*)
 needle production, 250
 Stachene, 158
 Staphylococcus aureus
 amino acid accumulation, 446
 rRNA degradation, 30
 ribosome destruction, 30
 Starch, 404
 carbohydrate metabolism in dark, 392-93
 Statoliths, 193
 Status albamaculatus, 217
 Status paralbomaculatus, 217
 Stevia rebaudiana
 ent-kaurene, 162
 steviol, 162
 Steviol, 162, 169, 177
 metabolism, 175-76
 Steviol-13-acetate
 metabolism, 177
 Stomata
 crassulacean acid metabolism, 385-87
 Streptomycin
 chloroplast DNA elimination, 218
 Succinate
 δ -aminolevulinic acid formation, 106
 delayed fluorescence stimulation, 60
 Succinate thiokinase, 76
 Succinyl CoA
 δ -aminolevulinic acid formation, 98-102, 114
 Succinyl-CoA synthetase, 75
 Sucrose, 402, 491-92
 osmotic balance adjustment, 132
 sulfated fucan, 493
 vacuolar accumulation, 204
 Sugar beet (*Beta*)
 aluminum
 beneficial effect, 522
 phosphate, 518
 ATPase, 450
 spinach
 photosynthesis enhancement, 228
 Sugarcane (*Saccharum*)
 iron toxicity, 531
 physiology, 533
 manganese/zinc effect, 524
 toxicity, 531
 Sugar
 localization, 197
 vacuolar accumulation, 204
 Sugar localization, 197
 Sulfate
 foliar lead, 540-41
 polysaccharide sulfation, 502
 Sulfated polysaccharides
 cell polarity, 492-93
 stain, 493
 Sulfur dioxide
 metal interactions, 542
 Sunflower (*Helianthus*)
 organic manganese complex, 530
 research needs to increase yields, 309
 T
 Tea (*Thea*)
 aluminum
 beneficial effect, 522
 injury protection, 516, 520
 TCA cycle, 87-88, 394, 396, 400-1, 403
 block
 blue-green algae, 74-75

- Chlamydomonas, 76
 lack
 Chloropseudomonas, 72
 Chromatium, 70
 nitrogen fixation, 272
 pyruvate oxidation, 402
 Rhodospirillum, 70-71
 Temperature
 aluminum toxicity, 512
 chilling injuries
 membrane structure, 13
 cold
 crossing-over reduction, 433
 day
 crassulacean acid metabolism, 387-88
 delayed fluorescence, 51-52, 54
 low temperature emission, 57-58
 thermoluminescence, 58-60
 manganese toxicity, 527
 night
 crassulacean acid metabolism, 387
 P700 photooxidation, 353
 see also Heat effects on protein synthesis; Photosynthesis apparatus energy transfer
 Tetrahymena pyriformis, 30
 DNA synthesis, 26
 RNA
 degradation, 30
 synthesis, 27
 Tetrapyrrole pathway, 96
 outline, 98
 primary products, 96
 Thalassia testudinum
 bicarbonate utilization, 84
 carbon isotope fractionation, 82
 photosynthesis, 78-79
 ultrastructure, 78-79
 $\delta^{13}\text{C}$ values, 83
 Tea
 see Tea
 Thermolysin, 200
 Thermus aquaticus, 32
 Thiobacillus denitrificans
 α -ketoglutarate dehydrogenase lack, 74
 Thiomethylgalactoside accumulation, 445
 Thiorhodaceae
 facultative photoautotrophy, 68
 Threonine, 77
 Thylakoid
 membrane
 delayed fluorescence, 60
 reorganization in heterocysts, 324
 TIBA meristem determination, 256
 Tobacco (Nicotiana)
 chloroplast ribosomal proteins
 nuclear genome effect, 220-21
 gibberellin
 3β -hydroxylation, 174
 ent-kaurene synthetase, 180
 iron toxicity, 532
 physiology, 533
 photorespiration, 233
 ribulose biphosphate carboxylase, 226
 chloroplast DNA code, 226
 peptide composition, 233
 Tolypothrix tenuis
 oxidative pentose phosphate pathway, 75
 Tomato (Lycopersicon)
 ammonium toxicity, 515
 phosphorus nutrition, 517-18
 ent-kaurene synthetase, 180
 leaf initiation, 247
 manganese toxicity
 injury type, 528
 internal levels, 526
 iron ratio, 527
 iron treatment, 528
 organic complexes, 530
 metal toxicities, 542
 nickel translocation, 540
 Tonoplast, 196, 395-96
 chloride transport, 451
 cytoplasm entity, 211
 glucose specific hexokinase, 199, 209
 malate accumulation, 205
 malic acid transport, 399, 403
 membrane transport, 199, 202
 arginine-specific permease, 199
 problems with vacuole isolation, 195
 properties, 198-99
 oxidoreductases, 199
 plasmalemma difference, 198
 rRNA, 199
 sodium transport, 449
 sucrose phosphatase, 204
 sucrose synthetase, 199
 transport specificity, 197-98
 Tracheophyta, 84
 Trachylobane, 158
 Transpiration
 calculation, 283
 plant productivity
 runoff, 283-84
 soil evaporation, 284-85
 soil water change, 285-86
 transpiration modulation, 286-89
 water limitation, 282
 Triazolealanine, 334
 Trifolium
 see Clover
 Triiodobenzoic acid
 phyllotactically altered plants, 242
 Trisoxalatochromium, 541
 Trisporic acids
 Mucorales, 476
 Mucor mutans, 477
 Triticale
 aluminum tolerance, 523
 Triticum aestivum
 gibberellins, 183
 nucleic acids in apex, 247-48
 Triticum spp.
 gibberellin metabolites identification, 154-55
 melocyte perturbations, 433
 provascular tissue, 243
 see also Wheat
 Tryptophan synthetase, 208
 Tulipa
 flowering induction, 248
 vacuole
 ATPase, 199
 ion content, 198
 Tunicamycin, 207
 Turgor- and osmoregulation
 physics, 121-48
 biphasic osmotic regulatory response, 125
 nonosmotic cell volume, 127
 volumetric elastic modulus, 129-31
 walled cells, 128-31
 wall-less cells, 126-28
 cell volume measurements, 127
 modified Coulter counter, 128, 139
 conclusions, 142-43

614 SUBJECT INDEX

- effective elastic modulus, 140
 introduction, 121-22
 measurement, 122-25
 osmotic agents nature, 131-33
 compatible solute, 133
 osmotic balance adjustment, 132
 regulation, 131-33
 turgor pressure regulation, 132
 turgor-dependent processes, 133-37
 action potential, 136
 extension growth regulation, 135
 membrane potential depolarization, 135-36
 membrane transport, 134
 turgor-sensing mechanisms, 137-42
 dielectric breakdown of membrane, 138-40
 electromechanical model, 137-42
 electromechanical transduction, 142
 fluid mosaic model, 141
 membrane compression, 140-41
 membrane electrical potential, 138-39
 piezoelectricity, 142
 Turgor pressure
 enzyme penetration, 141
 marine algae, 128
 measuring and manipulating methods, 122
 external force, 124
 microcapillaries, 123-24
 pressure bomb, 122
 pressure probe, 124-25
 vapor pressure equilibration, 122
 wedge, 124
 osmotic pressure control, 121
 sensing mechanisms, 127-42
 Tyrosine, 32
- U
- U-protein, 429-31, 434-35
 R-protein interaction, 432
 Urease, 545
 Uridine, 20
 Uroporphyrinogen, 223
- V
- Vacuole
 chloride transport, 450
 malic acid, 399
 accumulation, 397
 efflux, 396, 401
 sodium uptake, 450
 Vacuoles function and biochemistry, 193-213
 analysis of vacuoles
 isolation methods, 194-95
 solute extraction from cells, 195-96
 conclusion, 210-11
 functional aspects
 detoxification, 206
 storage pools of intermediates, 204-5
 turgor, 205-6
 introduction, 193-94
 lysosome intracellular digestion
 autophagic vacuoles, 209
 catabolite inactivation, 209
 compartmentation role, 208-9
 hypothetical evaluations, 209-10
 protein degradation, 208-9
 lysosome vacuolar hydrolase, 206-8
 as storage compartments
 accumulation, 201-4
 cell sap constituents, 196-98
 membrane transport in tonoplast, 199-201
 tonoplast properties, 198-99
- Valinomycin, 37, 61, 445
 transient hyperpolarization, 448
- Vallisneria denseserrulata
 photosynthetic rates, 85
- Valonia
 macrophysa
 turgor pressure, 128
 utricularis
 dielectric breakdown of membrane, 140
 potassium influx-efflux control, 134-35
 salinity stress effect, 132
 turgor pressure measurements, 123, 128
 turgor regulation kinetics, 128
- volumetric elastic modulus values, 129
- ventricosa
 turgor pressure effect on ion flux, 135
 turgor pressure measurement, 124
 turgor pressure sensing, 140
- Valonis spp., 141
 elastic modulus, 135
 osmotically active molecules regulation, 131
 water permeability, 136
- Vibrio marinus
 protein synthesis impairment, 30
 temperature and RNA synthesis, 27
- Vicia
 see Broad bean
- Vigna
 see Cowpea
- Vitamin B₁₂, 96, 98
- Vitis
 see Grape
- Volcani Agricultural Research Institute, 22
- Volumetric elastic modulus values, 129-30
- Volvox aureus
 pheromone, 478
- Volvox spp.
 pheromones, 478
 biological activity, 478
 characterization, 478
 origin, 481
 structure, 477
- W
- Water
 cell sap constituent, 196
 limit to plant growth, 277-78
 permeability, 136-37
 soil evaporation, 284-85
 stress
 floral primordia, 302
 use efficiency, 282
 see also Crassulacean acid metabolism; Plant productivity; Turgor- and osmoregulation physics; Turgor pressure
- Welwitschia mirabilis
 carbon dioxide fixation, 406
 crassulacean acid metabolism, 382

- Wheat (*Triticum*), 305-6
 aluminum, 519
 beneficial effect, 522
 calcium, 517
 genetic control of tolerance, 522-23
 iron interaction, 521
 manganese, 525
 phosphorus interaction, 517-18
 root phosphatase, 519
 root zone pH change, 514-15
 tolerance, 514-16
 toxicity, 512
 uptake, 516
 crossing-over reduction, 433
 cultivars water use efficiency, 296
 glycine incorporation into chlorophyll, 102
 harvest index, 304
 manganese toxicity, 527
 synaptonemal complexes, 433
 theoretical yield, 228
 water stress
 seed filling, 303-4
 tiller mortality, 302
 water use rationing, 301
 Wildman, S., 21
 Willow (*Salix*)
 polarity, 488
 X
 Xanthium
 gibberellin effect on plastochron, 251
 phyllotaxis alteration, 242
Xylopia aethiopica
 ent-15 α -hydroxykaurenoic acid metabolism, 177
 xylopic acid, 162
Xylopic acid, 162, 177
 Y
 Yeast
 manganese effect, 524
 septum formation, 499-500
 Young, R., 18
 Z
 Zea
 see Corn; Maize
 Zinc
 chelates in xylem, 540
 cofactor, 4
 ecotype tolerance, 545-46
 mechanism, 546-47
 labile pool, 538
 manganese translocation, 541
 nickel toxicity counteraction, 544
 ozone interaction, 542
 peach little leaf treatment, 3-4
 plant uptake, 539
 soil equilibria, 537-38
 toxicity, 513
 differential tolerance, 545
 iron interaction, 541
 manganese interaction, 524
 natural occurrence, 536
 study, 544
 symptoms, 541-42
 zinc sprays, 537
 Zinc oxysulfate, 513, 537
 Zygosphere, 475-76
 Zygotene
 DNA
 crossing-over roll, 426
 synthesis, 424-25, 430